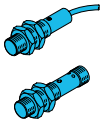
	Housing design Size (mm)	Switching distance (mm)	flush (f) / non-flush (nf)	Switching output	Switching frequency (Hz) / mode	IO-Link adjustments	Potentiometer sensitivity adjustments	Housing material	Protection class	Cable material/length, Plug connector	Product description
KNS Extended with potentiometer											
	Ø 6.5x52	2.0 (0.1 to 3.0)	f	Push-pull, 100 mA, NO/NC	100 Hz		■	Stainless steel V2A	IP 65, IP 67	2 m/PVC	KNS D6.5M 02B G3-2R
	Ø 6.5x60									M8	KNS D6.5M 02B G3-T3
	Ø 6.5x52	3.0 (0.1 to 4.0)	nf	Push-pull, 100 mA, NO/NC	100 Hz		■	Stainless steel V2A	IP 65, IP 67	2 m/PVC	KNS D6.5M 03N G3-2R
	Ø 6.5x60									M8	KNS D6.5M 03N G3-T3
	M8 x 52	3.0 (0.1 to 4.0)	nf	Push-pull, 100 mA, NO/NC	100 Hz		■	Stainless steel V2A	IP 65, IP 67	2 m/PVC	KNS M8M 03N G3-2R
	M8 x 60									M8	KNS M8M 03N G3-T3
	M12 x 55	4.0 (0.1 to 8.0)	f	Push-pull, 100 mA, NO/NC	100 Hz		■	Stainless steel V2A	IP 65, IP 67	2 m/PVC	KNS M12M 04B G3-2R
	M12 x 60									M12	KNS M12M 04B G3-B3
	M8 x 52	2.0 (0.1 to 3.0)	f	Push-pull, 100 mA, NO/NC	100 Hz		■	Stainless steel V2A	IP 65, IP 67	2 m/PVC	KNS M8M 02B G3-2R
	M8 x 60									M8	KNS M8M 02B G3-T3

KDC STANDARD

Capacitive proximity sensors in the KDC series are available in stainless steel and plastic housings. They are particularly suited for the detection of liquid, powdery and solid materials, as well as metallic and non-metallic parts. They are available in different sizes from M18 to M30 and Ø 50 mm.

CE

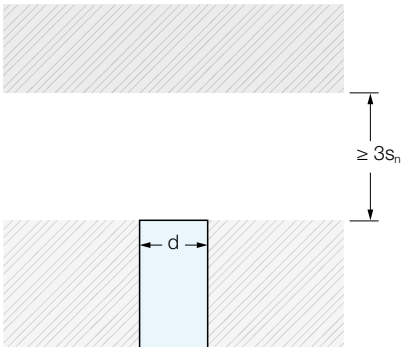
Technical data (typ.)	**+20 °C, 24 V DC**
Sensitivity adjustment	Using multiturn potentiometer or auto-teach key
Installation instructions	flush / non-flush / virtually flush (see page 126)
For more information, visit	www.di-soric.com

	Housing design Size (mm)	Switching distance (mm)	flush (f) / non-flush (nf)	Switching output	Potentiometer sensitivity adjustments	Auto-teach key	Housing material	Protection class	Cable material/length, Plug connector	Product description
KDC Standard										
	Ø 6.5 x 55	2.0 (0.1 to 3.0)	f	Push-pull, 150 mA, NO/NC		■	Stainless steel V2A	IP 65, IP 67	2 m / PUR	KDCT 6.5 V 02 G3-3
									2 m / PUR	KDCT 6.5 V 02 G3-4
	Ø 6.5 x 60	2.0 (0.1 to 3.0)	f	Push-pull, 150 mA, NO/NC		■	Stainless steel V2A	IP 65, IP 67	M8 3-pin	KDCT 6.5 V 02 G3-T3
									M8 4-pin	KDCT 6.5 V 02 G3-T4
	M8 x 52	2.0 (0.1 to 3.0)	f	Push-pull, 150 mA, NO/NC		■	Stainless steel V2A	IP 65	2 m / PUR	KDCT 08 V 02 G3-3
										KDCT 08 V 02 G3-4
	M8 x 60	2.0 (0.1 to 3.0)	f	Push-pull, 150 mA, NO/NC		■	Stainless steel V2A	IP 65	M8	KDCT 08 V 02 G3-T3
										KDCT 08 V 02 G3-T4
	M8 x 60	3.0 (0.1 to 4.0)	nf	Push-pull, 150 mA, NO/NC		■	Stainless steel V2A	IP 65	M8	KDCT 08 V 03 G3-T3
										KDCT 08 V 03 G3-T4
	M12x60	4.0 (0.1 to 6.0)	f	Push-pull, 150 mA, NO/NC, switchable		■	Stainless steel V2A	IP 65	2 m / PUR	KDCT 12 V 04 G3-4
									M12	KDCT 12 V 04 G3-B4

[1] Front side [2] Back side

INSTALLATION INSTRUCTIONS FOR CAPACITIVE PROXIMITY SENSORS

Flush installation (f)

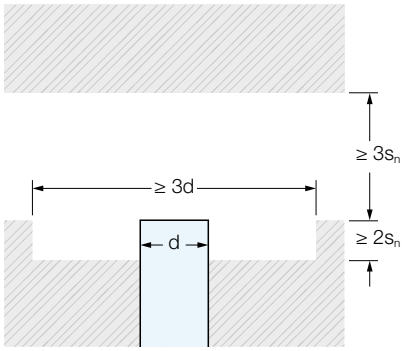


These proximity switches can be installed in all materials (metals / non-metals) such that the active sensor surface lines up flush with the surrounding material on the front side.

They have the following advantages:

- Flush installation in conductive materials (metals)
- Protection of the sensing surface prior to mechanical damage
- Less influence from external interference fields
- Less distance to the next proximity switch on the side

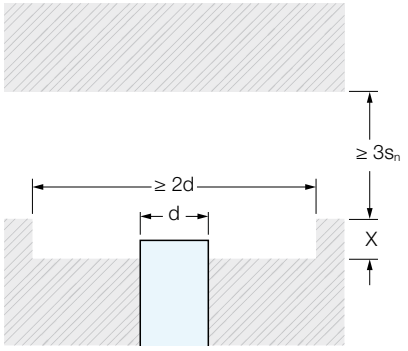
Non-flush installation (nf)



These proximity switches are allowed to be installed non-flush in conductive materials.
They have the greatest possible switching distance.
Special installation instructions apply to these proximity switches.

Flush installation in nonconductive materials is permitted.

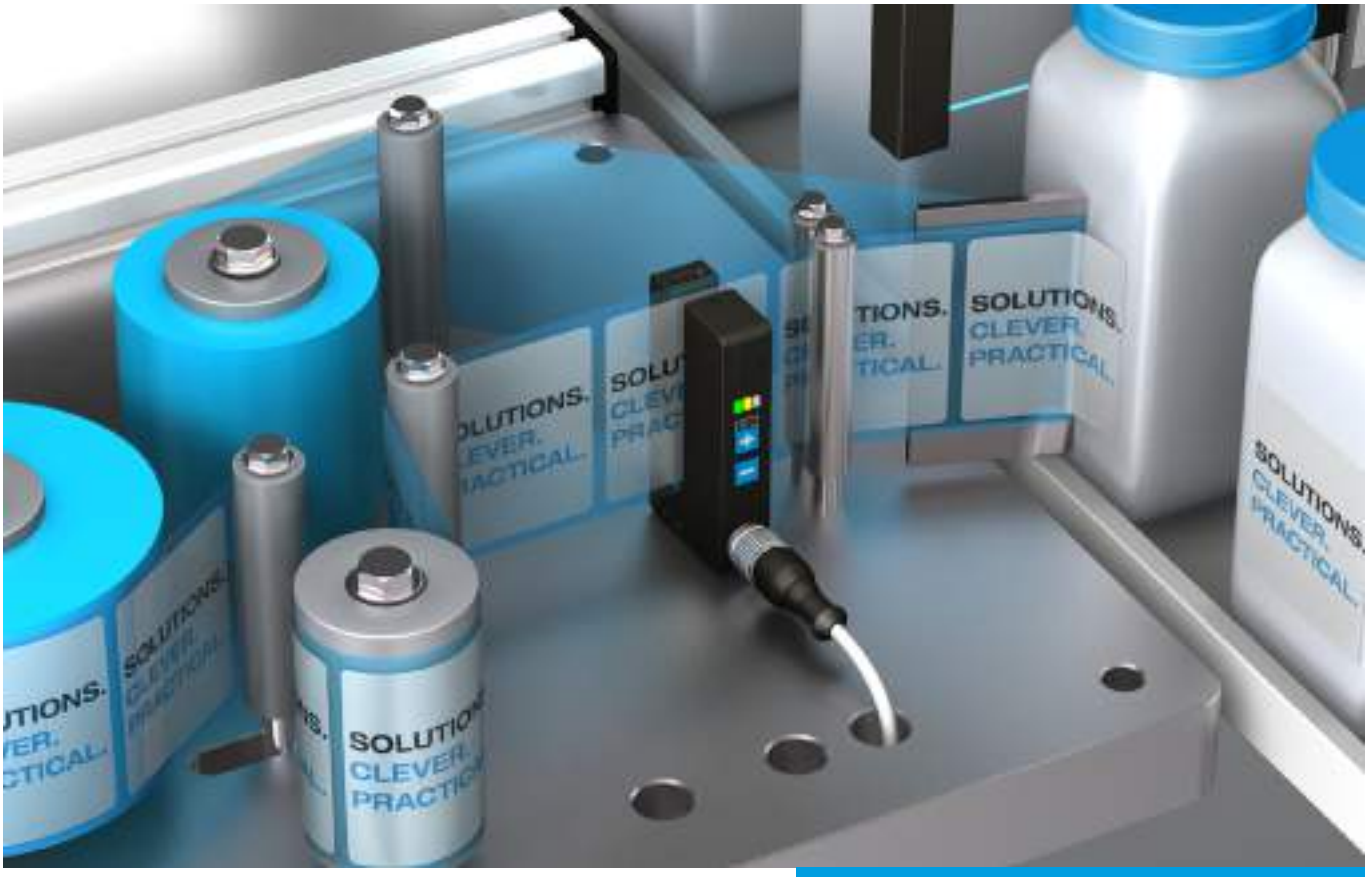
Quasi-flush installation (qf)



These proximity switches have a greater switching distance than proximity switches for flush installation. However, they are only allowed to be installed quasi-flush in conductive materials, i.e. not entirely flush. The proximity switches must protrude from the installation surface by dimension X (see the Installation instructions).

Flush installation in nonconductive materials is permitted.

Label sensors



When our sensors are used for label detection in a fork construction, labels can be positioned precisely at high belt speeds. They have been calibrated to a variety of different label materials (paper, metallic, transparent, thin/thick) and are available with different functional principles (optical/capacitive/ultrasonic).

Detection	Optical	Capacitive	Ultrasonic
Series	OGUTI	KSSTI	UGUTI
Very small labels	✓	✓	✓
Transparent labels		✓	✓
Metallic labels	✓		✓
Very thin labels	✓	✓	✓
Thick labels	✓	✓	✓
Booklets	✓		✓
Thick carrier material		✓	✓
Special requirements			
Exact positioning	✓	✓	✓
Maximum belt speed	✓		
Maximum reproducibility	✓		
Mounting directly on the dispensing edge	✓		
IO-Link			✓
Manual teach			✓
Auto-teach	✓	✓	✓
Remote teach	✓	✓	✓
Adjustable pulse stretching (using IO-Link)			✓
Warning output			✓

OGUTI OPTICAL

The compact, OGUTI optical label sensors detect both thin and thick paper labels with outstanding speed and precision thanks to their large fork openings. They stand out for their extremely high dispensing precision and reproducibility, making maximum belt speeds possible. Using auto-teach, they can be taught in to new materials quickly and intuitively.

CE

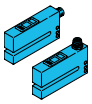
Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 35 V DC
Ambient temperature	-10 to +60 °C
Housing material	Die-cast zinc, varnished

	Fork/slot width (mm)	Slot depth (mm)	Infrared light, 880 nm, clocked	Switching output	IO-Link interface	No-load current (mA)	Activation time (µs)	Max. belt speed (m/min)	Reproducibility (µm)	Sensitivity adjustment using teach button	Sensitivity adjustment using remote teaching	Plug connector	Connection cable (optionally available)	Product description
OGUTI Optical														
	2	40	■	pnp 200 mA, NO/NC		35	166	500	< 50	■		M8	TK …	OGUTI 002 P3K-TSSL
										■	■		TK … /4	OGUTI 002 FP3K-TSSL
	5	50	■	Push-pull 200 mA, NO/NC		35	166	500	< 50	■		M8	TK …	OGUTI 005/50 G3K-TSSL
										■	■		TK … /4	OGUTI 005/50 FG3K-TSSL

UGUTI ULTRASONIC

The UGTI ultrasonic label sensors can be used universally for a wide variety of label materials. They reliably detect not only thin and thick transparent, foil and paper labels but also metallic labels. The innovative dual operation concept—implemented using either IO-Link or auto-teach—makes it possible to put the sensors into operation quickly.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 30 V DC
Ambient temperature	0 to +60 °C
Housing material	Aluminum, black anodized

	Fork/slot width (mm)	Slot depth (mm)	Infrared light, 880 nm, clocked	Switching output	IO-Link interface	No-load current (mA)	Activation time (µs)	Max. belt speed (m/min)	Reproducibility (µm)	Sensitivity adjustment using teach button	Sensitivity adjustment using remote teaching	Plug connector	Connection cable (optionally available)	Product description
UGUTI Ultrasonic														
	6	70		2 independent outputs, push-pull, 100 mA, NO/NC	■	40	< 250	250 [1]	< 200 [2]	■	■	M12	VK .../5	UGUTI 6/70 G6-B5
												M12 (radial)		UGUTI 6/70 G6-RB5

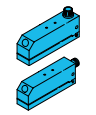
[1] 2 mm label and 2 mm gap
[2] Depends on the label material and carrier material

KSSTI CAPACITIVE

The KSSTI capacitive label sensors are the solution of choice for detecting thin transparent labels, foil labels and paper labels. They show their strengths particularly well wherever high tape speeds are required. Using auto-teach, they are taught in to new materials quickly and intuitively.

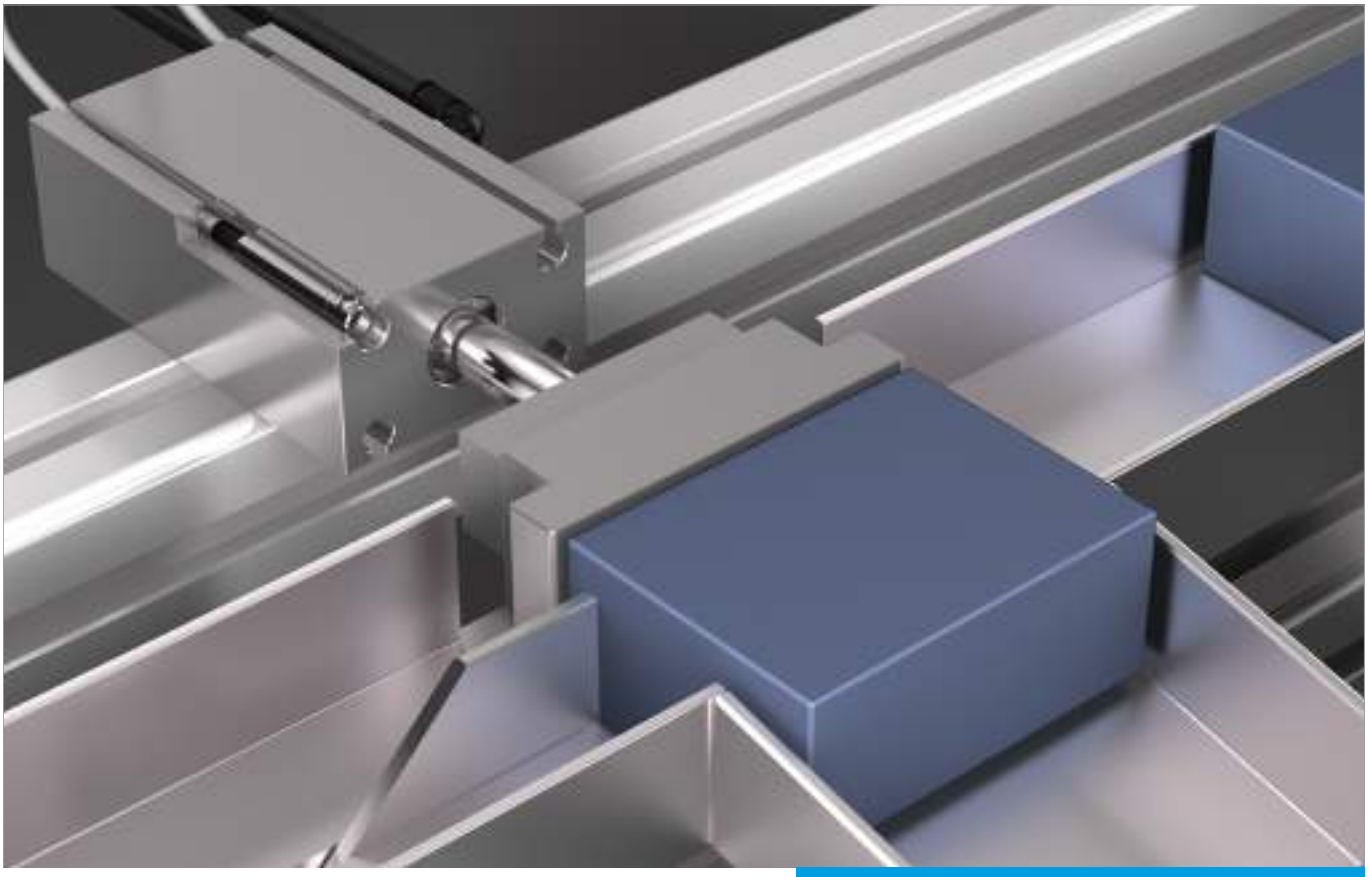
Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 35 V DC
Ambient temperature	0 to +60 °C
Housing material	Aluminum, black anodized

CE

	Fork/slot width (mm)	Slot depth (mm)	Infrared light, 880 nm, clocked	Switching output	IO-Link interface	No-load current (mA)	Activation time (µs)	Max. belt speed (m/min)	Reproducibility (µm)	Sensitivity adjustment using teach button	Sensitivity adjustment using remote teaching	Plug connector	Connection cable (optionally available)	Product description
KSSTI Capacitive														
	0.4	50		Push-pull 200 mA, NO/NC		70	< 600	300 [1]	< 150 [2]	■		M8	TK …	KSSTI 400 G3K-TSSL
										■	■		TK … /4	KSSTI 400 FG3K-TSSL
	0.6	50		Push-pull 200 mA, NO/NC		70	< 600	300 [1]	< 150 [2]	■		M8	TK …	KSSTI 600 G3K-TSSL
										■	■		TK … /4	KSSTI 600 FG3K-TSSL
	1.0	50		Push-pull 200 mA, NO/NC		70	< 600	300 [1]	< 150 [2]	■		M8	TK …	KSSTI 1000 G3K-TSSL
										■	■		TK … /4	KSSTI 1000 FG3K-TSSL
	0.6	85		Push-pull 200 mA, NO/NC		70	< 600	300 [1]	< 150 [2]	■	■	M12	VK …/4	KSSTI 600/80 FG3LK-IBS
	1.0									■	■			KSSTI 1000/80 FG3LK-IBS
	0.6	85		Push-pull 200 mA, NO/NC		70	< 600	300 [1]	< 150 [2]	■	■	M12	VK …/4	KSSTI 600/80 FG3LK-AIBS
	1.0									■	■	M12 (radial)		KSSTI 1000/80 FG3LK-AIBS

[1] 2 mm label and 2 mm gap
[2] Depends on the label material and carrier material

Magnetic field sensors



Magnetic field sensors are designed for pneumatic cylinders with integrated magnets. The piston position is detected through the cylinder wall.

MZEC CYLINDER SENSORS C-GROOVE

Our cylinder sensors for the C groove are designed for all common pneumatic cylinders with installed magnets.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 30 V DC
Switching output	Transistor pnp / NO
Voltage drop	2.0 V
	2.5 V (MZEx 9-xx…)
Switching frequency	1,000 Hz
Ambient temperature	-25 to +70 °C
	-25 to +80 °C (MZEC 9-xx…)
Insulation proof voltage	500 V
Polarity-safe	Yes
Protection class	IP 67
	Mounting lengthwise along the groove
	Can be inserted into the groove from above

CE

	Housing design Size (mm)	Installation method	Housing material	Switching output	Short-circuit-proof	Reproducibility (mm)	Cable length (m)	Plug connector	Connection cable (optionally available)	PUR connection cable, welding spark-resistant	Product description
MZEC Cylinder Sensors C-groove											
	Ø 3.7 x 21		V2A (1.4301 / AISI 304) / plastic	Transistor pnp 100 mA, NO		0.1	2.5	–	–		MZEC 3.7 PSL
							0.3	M8	TK …		MZEC 3.7 PS-K-TSSL
							0.6	M8	TK …		MZEC 3.7 PS-K0.6-TSSL
							0.3	M12	VK …		MZEC 3.7 PS-K-IBS
	Ø 3.7 x 21		V2A (1.4301 / AISI 304) / plastic	Transistor pnp 100 mA, NO		0.1	0.3	M8	TK …		MZEC 3.7 VPS-K-T3
							0.6	M8	TK …		MZEC 3.7 VPS-K0.6-T3
							0.3	M12	VK …		MZEC 3.7 VPS-K-B3
	Ø 3.7 x 21		V2A (1.4301 / AISI 304) / plastic	Transistor pnp 100 mA, NO		0.1	0.3	M8	TK …		MZEC 3.7 VNS-K-T3
							0.6	M8	TK …		MZEC 3.7 VNS-K0.6-T3
							0.3	M12	VK …		MZEC 3.7 VNS-K-B3
	Ø 4.0 x 25		V2A (1.4301 / AISI 304) / plastic	Transistor pnp 100 mA, NO		0.1	2.5	–	–		MZEC 4.0 PSL
							0.3	M8	TK …		MZEC 4.0 PS-K-TSSL
							0.6	M8	TK …		MZEC 4.0 PS-K0.6-TSSL
							0.3	M12	VK …		MZEC 4.0 PS-K-IBS
	2.8 x 7.7 x 17.5		Polyamide, mounting eccentric stainless steel	Transistor pnp 100 mA, NO	■	0.2	2.0	–	–	■	MZEC 9-18 PSL
							0.3	M8	TK …		MZEC 9-18 PSL-K-TSS
	2.8 x 5 x 25.8		Polyamide, mounting eccentric stainless steel	Transistor pnp 100 mA, NO	■	0.2	2.0	–	–	■	MZEC 9-26 PSL
							0.3	M8	TK …		MZEC 9-26 PSL-K-TSS

MZET CYLINDER SENSORS T-GROOVE

Our cylinder sensors MZET for the T groove are designed for all common pneumatic cylinders with installed magnets.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 30 V DC
Switching output	Transistor pnp / NO
Voltage drop	2.0 V
Switching frequency	1,000 Hz
Ambient temperature	-25 to +70 °C
Insulation proof voltage	500 V
Polarity-safe	Yes
Protection class	IP 67
	Mounting lengthwise along the groove
	Can be inserted into the groove from above

CE

	Housing design Size (mm)	Installation method	Housing material	Switching output	Short-circuit-proof	Reproducibility (mm)	Cable length (m)	Plug connector	Connection cable (optionally available)	Connection cable, PUR, welding-spark-resistant	Product description
MZET Cylinder Sensors T-groove											
	5 x 7 x 17	←	Die-cast zinc	Transistor pnp, 200 mA, NO	■	0.1	–	M8	TK …		MZERT 17 PSK-TSSL
	5 x 7 x 20	↓	Die-cast zinc	Transistor pnp, 200 mA, NO	■	0.1	–	M8	TK …		MZERTI 20 PSK-TSSL [1]
											MZERTI 20 PSK-TSSL [1]
	6.1 x 5 x 25	←	Die-cast zinc	Transistor pnp, 200 mA, NO	■	0.1	2.5	–	–	■	MZET 25 PSLK
							0.3	M8	TK …		MZET 25 PSK-K-TSSL
							0.6	M8	TK …		MZET 25 PSK-K0.6-TSSL
							0.3	M12	VK …		MZET 25 PSK-K-IBS
	6.1 x 5 x 28	↓	Die-cast zinc	Transistor pnp, 200 mA, NO	■	0.1	2.5	–	–	■	MZET 28 PSLK
							0.3	M8	TK …		MZET 28 PSK-K-TSSL
							0.6	M8	TK …		MZET 28 PSK-K0.6-TSSL
							0.3	M12	VK …		MZET 28 PSK-K-IBS
	5 x 6.5 x 25	↓	Polyamide, mounting eccentric stainless steel	Transistor pnp, 200 mA, NO	■	0.2	2.0	–	–	■	MZET 9-25 PSL
							0.3	M8	TK …		MZET 9-25 PSL-K-TSS
							0.3	M12	VK …		MZET 9-25 PSL-K-IBS
	5.2 x 6.5 x 25	↓	Die-cast zinc	Transistor pnp, 200 mA, NO	■	0.1	2.5	–	–	■	MZEK 25 PSLK [2]
							0.3	M8	TK …		MZEK 25 PSK-K-TSSL [2]
							0.6	M8	TK …		MZEK 25 PSK-K0.6-TSSL [2]
							0.3	M12	VK …		MZEK 25 PSK-K-IBS [2]

[1] With an Allen screw

[2] Mounting with clamping wedge (internal hex SW 1.5 mm)

MZES GRIPPER SENSORS

Our gripper sensors are designed and developed for gripper systems that are used in automated processes as end-of-arm tooling on portals and robots. The gripper systems are designed individually for the respective application cases in the most varied industries.

Technical data (typ.)	**+20 °C, 24 V DC**
Service voltage	10 to 30 V DC
Switching output	Transistor pnp / NO
Voltage drop	2.0 V
Switching frequency	1,000 Hz
Ambient temperature	-25 to +70 °C
Insulation proof voltage	500 V
Polarity-safe	Yes
Protection class	IP 67
	Mounting lengthwise along the groove
	Can be inserted into the groove from above

CE

	Housing design Size (mm)	Installation method	Housing material	Switching output	Reproducibility (mm)	Cable length (m)	Plug connector	Connection cable (optionally available)	PUR connection cable, welding spark-resistant	Product description
MZES Gripper Sensors for the C-groove										
	Ø3.9x21		Stainless steel, plastic	Transistor pnp, 100 mA, NO	0.1	2.5	–	–		MZES 3.9 PSL
						0.3	M8	TK …		MZES 3.9 PS-K-TSSL
						0.6	M8	TK …		MZES 3.9 PS-K0.6-TSSL
MZES Gripper Sensors for the T-groove										
	6.1 x 5 x 25		Die-cast zinc	Transistor pnp, 100 mA, NO	0.1	2.5	–	–	■	MZES 25 PSL
						0.3	M8	TK …		MZES 25 PS-K-TSSL
						2.5	–	–	■	MZES 25 PSL *
						0.3	M8	TK …		

* Mounting with clamping wedge

Optical movement sensors

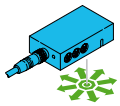
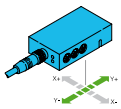
Our special sensors solve special detection tasks and are designed for specific applications. di-soric's range of products thus includes movement sensors for contact-free detection of movements.

OBS OPTICAL MOTION SENSORS

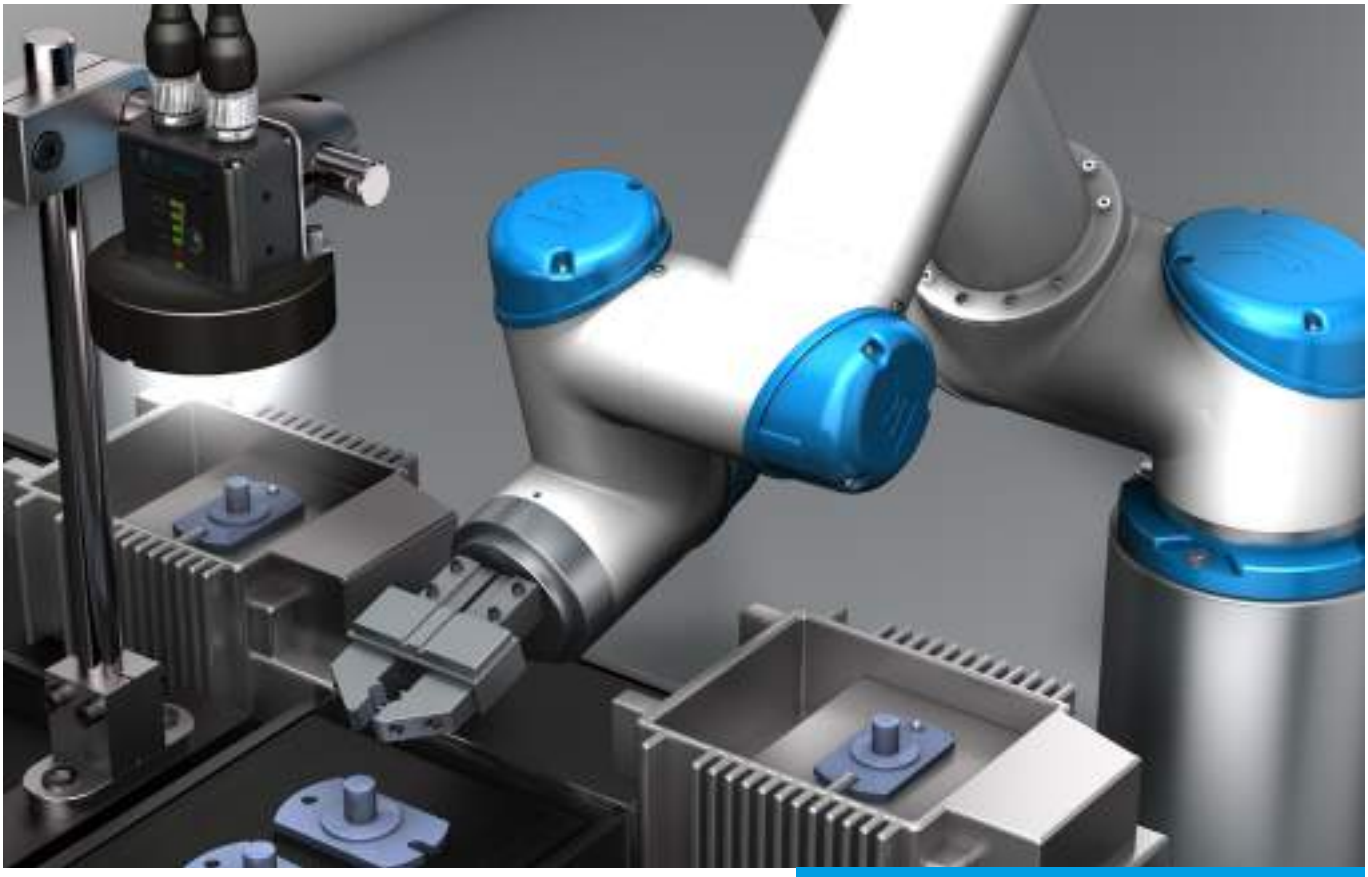
The OBS optical movement sensors are used for contact-free close-range detection of movements and direction of movement. The sensors have a detection range of 20 mm to 40 mm. They can distinguish between movement and standstill and, have an option for detecting the direction of movement. The standstill speed up to 5 m/s is easy to set using a potentiometer.

Technical data (typ.)	**+20 °C, 24 V DC**
Service voltage	10 to 30 V DC
No-load current	30 mA
Diameter of light spot	Ø 2.0 mm
Working distance	30 ±10 based on material
Pulse stretching	1 to 1,000 ms, adjustable
Activation time	10 ms
Emitted light	Infrared laser, 850 nm
Laser class (EN 60825-1)	1M
Ambient light immunity	5 kLx
Ambient temperature	+5 to +45 °C
Insulation proof voltage	500 V
Protection class	IP 67
Protection class	III, operation on protective low voltage
Housing material	Aluminum, black anodized
Window material	PMMA

CE

	Movement sensor	*Detection of direction*	*Emitted light*	*Speed (m/s, based on material)*	*Push-pull, 150 mA*	*NO/NC, switchable*	*NO*	*Voltage drop (V)*	*LED: Switching output*	*LED: Switching output (yellow), operation (green)*	*Plug connector*	*Connection cable (optionally available)*	*Product description*
OBS Optical motion sensors													
	■		Laser, infrared	<5.0	1x	■		2.5		■	M8, 3-pin	TK …	OBS 60 M 30 G3-T3
	■	X or Y	Laser, infrared	<5.0	2x		■	2.0	2x		M8, 4-pin	TK … /4	OBSR 60 M 30 G8-T4

Vision sensors



di-soric

The Vision Sensors from di-soric are intuitively operated Smart Vision sensor systems that can be put into operation within minutes and without training. The Vision Sensors can be used out-of-box and have an extensive assortment of software tools and standardized interfaces for communication with peripherals.

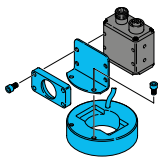
CS-50

High-performance and fast – as the smallest vision sensor on the market, CS-50 offers big performance for numerous testing tasks in industrial applications. It has the most varied communication interfaces and extensive accessories. In the most varied industrial environments, it is ideally suited for completeness control, rotation tests, presence control and much more.

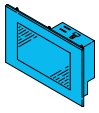
Technical data (typ.)	+20 °C, 24 V DC
Service voltage	4.75 to 30 V DC
No-load current	150 mA, (24 V DC)
Dimensions (H x W x D)	25.4 x 44.5 x 44.5 mm
Control buttons	1
Interchangeable light	Yes (red, white, blue, infrared)
Ambient temperature	0 to +40 °C
Protection class	IP 65, IP 67
Protection class	III, operation on protective low voltage
Housing material	Aluminum, black
Weight	68 g
Vibration/shock resistance	55 Hz sine / 2,000 Hz random / 50 g
Number of inputs/outputs	1/3
External trigger input	off = < 1.0 V (ON input)
Inspection tasks	Locating, counting, presence, measuring, logic
Equipment	Internal trigger
	External trigger input
	PC software setup
	Logic for user-defined outputs
	Highest resolution (640 x 480 pixels)
Image output	b/w, VGA
Number of jobs	Unlimited (1.4 GB)
	1 -255 for operation with Profinet
Exposure time	66 to 58.825 µs

CE

	Focal length (mm)	Working distance (mm)	Light color	Max. part speed (images/sec)	Profinet	RS 232	Ethernet / IP	TCP/IP	Product description
CS-50									
	5 / 10	50 to 300	High power, red	42	■	■	■	■	CS 50 BM2-2-ES-G1
			High power, white						CS 50 BM2-2-ES-G5
	16 / 32	50 to 150	High power, red	42	■	■	■	■	CS 50 BM2-4-ES-G1
			High power, white						CS 50 BM2-4-ES-G5
	16 / 32	75 to 1200	High power, red	42	■	■	■	■	CS 50 BM2-4L-ES-G1
			High power, white						CS 50 BM2-4L-ES-G5



Accessories for CS-50 Vision Sensors



see “Accessories for CS-50”, page 213

CS-60

Due to easy lens changing and integrated high-performance illumination, the CS-60 creates excellent images with respect to distance, field of vision and resolution. The extensive tools can be easily expanded through software upgrades and may be individually customized as needed. Comfortable, logical linking of tools and the versatile Profinet connection to the existing PLS component complete its flexibility.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	18 to 30 V DC
No-load current	< 1000 mA, (24 V DC)
Voltage drop	< 2.0 V
Insulation voltage endurance	500 V
Housing material	Die-cast zinc (black powder-coated)
Ambient temperature	0 to +50 °C
Lens connection	S-mount
Weight	250 g
Protection class	III, operation on protective low voltage
Working distance	50 to 2,000 mm
Design	Cuboid design
Internal lighting	Switchable integrated illumination:
	High Power red, High Power white
Switching output	Push-pull, 150 mA
Interfaces & protocols	Digital I/O, TCP/IP, Profinet, HTTP, FTP/SFTP, ReST API
Focal length	8 mm
Display	LED green - in operation,
	yellow - DATA-Link yellow - Trigger
Ambient temperature during operation	0 to +50 °C
Protection class	IP 67
Connection	Connector, M12, 12-pin (A-coded)
Connection 2	Socket, M12, 8-pin

CE

	Software										
	Localization	Detect	Counting	Measuring	Read code	Resolution (pixel)	Type	Digital inputs / outputs	Optical format	Pixel size (µm)	Product description
CS-60											
	■	■	■			736 x 480	EV76C541	2 + 1 external trigger 4 + 1 ready signal	1/4"	4.5 x 4.5	CS60-BM28-EP15/300
	■	■	■		■						CS60-BM28-EP15/300ID
	■	■	■	■							CS60-BM28-EP15/400
	■	■	■	■	■						CS60-BM28-EP15/400ID
	■	■	■			1440 x 1080	IMX 273		1/2.9"	3.45 x 3.45	CS60-BM38-EP15/300
	■	■	■		■						CS60-BM38-EP15/300ID
	■	■	■	■							CS60-BM38-EP15/400
	■	■	■	■	■						CS60-BM38-EP15/400ID

Accessories for CS-60 Vision Sensors

see “Accessories for CS-60”, page 216

CS-60 UPGRADE LICENSES

The upgrade licenses expand a CS-60 Vision Sensor with additional functions such as measurement and localization and detection (reading) of 1D- and 2D-codes. To activate the upgrade, the license file is simply transferred to the sensor using the nVision-i Start interface.

- The CS60-UP-ID-LICENSE expands the sensors with the functions ID Code Localization and Detection. Using the code, its x/y position can be used for updating the following tools. 1D and 2D codes are also read.
- The CS60-UP-MEAS LICENSE expands the sensor with the functions of angle measurement, circle measurement, measurement of distances from lines to lines, from points to lines and from points to points.

Technical data (typ.)	+20 °C, 24 V DC
For more information, visit	www.di-soric.com
To be used for	CS-60 Vision Sensors
Model	Upgrade

	Inspection tasks	Code types 1D-Codes (barcodes)		Code types 2D-Codes	Product description
CS-60 upgrade licenses					
		▪ Code 39 ▪ Code 128 ▪ Interleaved 2 of 5 ▪ Codabar ▪ IATA 2 of 5 ▪ Hong Kong 2 of 5 ▪ Matrix 2 of 5 ▪ NEC 2 of 5 ▪ Pharmacode ▪ Straight 2 of 5	▪ GS1 DataBar RSS 14, ▪ GS1 DataBar RSS 14 Stacked ▪ GS1 DataBar Limited, ▪ GS1 DataBar Expanded, ▪ GS1 DataBar Expanded Stacked ▪ UPC A ▪ UPC E ▪ EAN 8 ▪ EAN 13	▪ Data Matrix ▪ Aztec Code ▪ PDF 417 ▪ PDF 417 Micro ▪ QR 2005 ▪ QR Micro ▪ QR Model 1	CS60-UP-ID-LIZENZ
	▪ Angle measurement ▪ Circle measurement ▪ Measurement of the distance between two lines ▪ Point-to-point measurement ▪ Point-to-line measurement				CS60-UP-MEAS-LIZENZ

CS 60 – Standard Tool-Set
Localization - Detection - Counting

\+ Reading 1D/2D Codes module

\+ Measurement module

\+ Measurement module

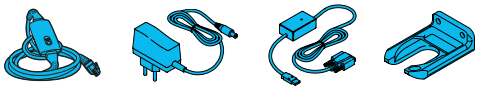
\+ Reading 1D/2D Codes module

Complete modules:	Complete modules:	Complete modules:
Localization	Localization	Localization
Detection	Detection	Detection
Counting	Counting	Counting
–	Measuring	Measuring
Reading 1D/2D Codes	Reading 1D/2D Codes	–

Handheld ID readers

In most industries, data must be detected quickly, reliably and flexibly. In this context, the ID handheld systems from di-soric are the first choice – from the lightweight hand-reading system to the extremely robust aluminum reader. The automatic scanners read and decode 1D and 2D codes in any process environment for an accelerated, stable process.

Technical data (typ.)	+20 °C, 24 V DC
Image sensor	CMOS
Optics	Fixed optics
For more information, visit	www.di-soric.com

	Warranty	Target setup	ESD-capable	Resolution (pixels)	Service voltage (VDC)	Protection class	Housing material	Connection	RS 232	USB	Product description
ID-10 Compact											
	2-year	■		960 x 640	5.0	IP 54	Plastic	Cable	■	■	ID-10-IM3-2-US
ID-80 Standard											
	5-year	■		1280 x 960	5.0	IP 54	Plastic	Cable	■		ID-80-IM3-2-S
										■	ID-80-IM3-2-U
ID-100 Advanced											
	3-year	■		1280 x 960	5.0	IP 54	Plastic	Cable	■	■[1]	ID-100-IM3-2-US
ID-200 Hammer											
	3-year	■	■	1280 x 960	5.0	IP 54	Aluminum	Cable	■	■	ID-200-IM3-2-US
Accessories for handheld ID readers											
	see "Identification system accessories", page 218										

[1] With separately available accessories

Lenses

The selection of the appropriate lens is decisive for the quality of the generated image and influence variables such as measuring accuracy, freedom from errors, distortion and therefore the reliability of the subsequent evaluation. di-soric lenses are available in various designs and impress with their very robust mechanical design and the highest optical quality.

O-C LENSES WITH C-MOUNT

The lenses in the O-C series are standard lenses with a fixed focal length and represent a good value for the money. With various models with different focal lengths, this series is suited for many applications in industrial image processing. A filter thread comes standard in all models. The lenses are distinguished by low optical distortion.

Technical data (typ.)	
Threaded connection	C-mount

CE

Focal length (mm)	Aperture ratio	Aperture (F)	Distortion	Minimum Object Distance MOD (mm)	M x filter thread Pitch P (mm)	Maximum resolution (megapixels)	Sensor size, max.	Weight (g)	Product description
O-C Lenses with C-mount									
8	1:1.4	1.4	< 0.7 %	100	M37 x 0.5	3	2/3"	10 g	O-C2-S-08-14
12	1:1.4	1.8	< – 0.3%	100	M27 x 0.5	3	2/3"	73 g	O-C2-S-12-14
16	1:1.4	1.8	< – 0.35 %	100	M27 x 0.5	3	2/3"	71 g	O-C2-S-16-14
25	1:1.4	1.8	< – 0.1 %	150	M27 x 0.5	3	2/3"	60.5 g	O-C2-S-25-14
50	1:2.6	1.8	< – 0.1 %	400	M27 x 0.5	3	2/3"	60 g	O-C2-S-50-26
8	1:1.4	2	< – 0.41 %	100	M58 x 0.75	6	1/1.2"	110.8 g	O-C4-S-08-14
12	1:1.4	2	< 1 %	100	M37.5 x 0.5	6	1/1.2“		O-C4-S-12-14
16	1:1.4	2	< 0.6 %	100	M30.5 x 0.5	6	1/1.2“	160.1 g	O-C4-S-16-14
25	1:1.4	2	< – 0.3%	200	M30.5 x 0.5	6	1/1.2“	97.3 g	O-C4-S-25-14
35	1:1.4	2	< – 0.41 %	200	M30.5 x 0.5	6	1/1.2“	94.4 g	O-C4-S-35-14
50	1:1.8	2	< 0.1 %	200	M37.5 x 0.5	6	1/1.2“		O-C4-S-50-18
12	1:1.8	2.8	< 0.51 %	100	M46 x 0.75	12	1.1"		O-C5-S-12-18/IR0
16	1:1.8	2.3	< 0.4 %	100	M43 x 0.75	12	1.1"		O-C5-S-16-18/IR0
25	1:1.8	2	< 0.25 %	100	M37.5 x 0.5	12	1.1"		O-C5-S-25-18/IR0

* Changeable, threaded diaphragm plates

O-S LENSES WITH S-MOUNT

The lenses in the O-S series are standard lenses with a fixed focal length and represent a good value for the money. With various models with different focal lengths, this series is suited for many applications in industrial image processing. With the ability to select between the pinhole aperture 4 and 8, different depths of field can be implemented.

Technical data (typ.)	
Threaded connection	S-mount

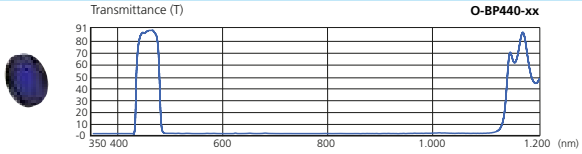
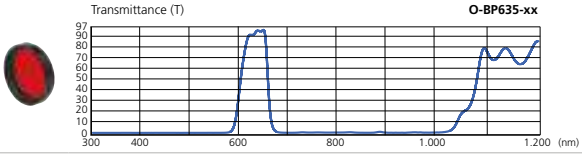
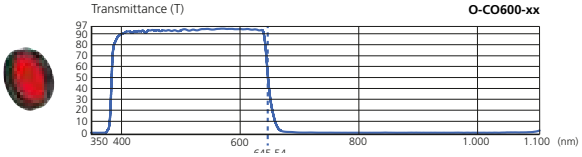
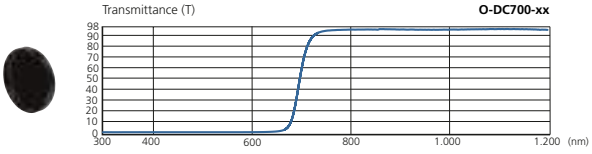
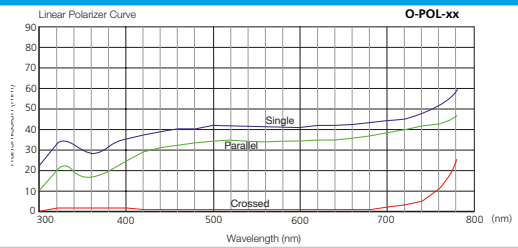
CE

Diameter (mm)	Wavelength	Focal length (mm)	Aperture (F)	Aperture type	Sensor size	Resolution	Working distance	Temperature resistance	Product description
O-S Lenses for CS-60									
14	400 to 950 nm	3.6	4.0	Fixed	1/2.5"	5 MP	Unlimited	-20 to +60 °C	O-S1-S-036-40
		3.6	8.0	Fixed	1/2.5"	5 MP			O-S1-S-036-80
		8	4.0	Fixed	1/3"	1 MP			O-S1-S-080-40
		8	8.0	Fixed	1/3“	1 MP			O-S1-S-080-80
		16	4.0	Fixed	1/3“	1 MP			O-S1-S-160-40
		16	8.0	Fixed	1/3“	1 MP			O-S1-S-160-80
		25	4.0	Fixed	1/2“	3 MP			O-S1-S-250-40
		25	8.0	Fixed	1/2“	3 MP			O-S1-S-250-80

O-Z LENS ACCESSORIES

The filters for our lenses are of the highest quality and are available for an extremely wide variety of applications. Whether polarization filters, bandpass filters, or cutoff filters – di-soric has the right accessories for nearly all applications in the area of optics for image processing and identification.

CE

	Wavelength	Transmission	Material Filter thread: Aluminium Filter: Glass	Mounting thread for additional filters	Filter thread M x pitch P (mm)	Product description
Bandpass filter						
	440 nm Blue		■		M27 x 0.5	0-BP440-27
					M30.5 x 0.5	0-BP440-30
					M37 x 0.5	0-BP440-37
	635 nm Red		■		M27 x 0.5	0-BP635-27
					M30 x 0.5	0-BP635-30
					M37 x 0.5	0-BP635-37
Cutoff filter						
	IR blocking filter open < 645 nm		■		M27 x 0.5	0-CO600-27
					M30.5 x 0.5	0-CO600-30
					M37 x 0.5	0-CO600-37
Daylight blocking filter						
	Daylight blocking filter open > 700 nm		■		M27 x 0.5	0-DC700-27
					M30.5 x 0.5	0-DC700-30
					M37 x 0.5	0-DC700-37
Polarization filter with locking screw						
			■	■	M27 x 0.5	0-POL-27
					M30.5 x 0.5	0-POL-30
					M37 x 0.5	0-POL-37

Spacer rings

Spacer distance (mm)	c-mount (ANSI) 1-32UN-2B / 1-32UN-2A	Product description
0.2	■	O-ET-020
0.5	■	O-ER-005
1.0	■	O-ER-010
10.0	■	O-ER-100
20.0	■	O-ER-200
30.0	■	O-ER-300
40.0	■	O-ER-400
50.0	■	O-ER-500
Set	■	O-ET-5

Converter

Magnification factor	c-mount (ANSI) 1-32UN-2B / 1-32UN-2A	For imagers up to 2/3"	Product description
1.5	■	■	O-1.5XNB
2.0	■	■	O-2.0XNB
2.5	■	■	O-2.5XNB
4.0	■	■	O-4.0XNB

nVision software

The visual development environment for industrial image processing.

nVision's speed and performance capacity along with its custom adjustment options give you the right solution for your job in image processing. The solution features a pioneering, intuitive and visually attractive user interface and reliable software.

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nVision is the result of over 20 years of experience in the area of image processing. We are continuously developing it using modern, powerful programming languages.

By offering the nVision image processing platform, di-soric is breaking down the boundaries that previously separated traditional smart camera programming from PC high-level language programming. nVision allows intuitive graphic programming. Function blocks can be created, saved and reused.

Users appreciate the unmatched flexibility and the extremely short programming and commissioning times. Customers acquire an individually tailored software package with runtime licenses adjusted to match their individual needs.
nVision can be used in all industries – in logistics as well as medical and clinical diagnosis.

Thanks to nVision, your projects can be implemented better and more quickly, ensuring more efficiency and profitability.

The easy-to-use image processing software for industry and science.

nVision is the unique and state-of-the-art culmination of 20 years of experience.
nVision is a complete and flexible solution, making it perfect for your applications in image processing as well.

Functions

- Live data processing
- Automation of your application
- All pixel calculations either monochromatic or in color
- Barcode and Data Matrix identification
- Completeness check
- Interactive measuring
- Font recognition (OCR, OCV)
- Pattern detection
- Surface inspection
- Position detection and robot guidance
- Printed image control
- Color recognition/color processing

Advantages

- Modern user interface
- Simple, intuitive and personalized operation
- Easy handling
- Top performance and stability
- Wide repertoire of functions
- Ensures that applications are feasible
- Less development time
- Time saving = Time to market is shortened
- Supports a wide variety of cameras
- Easy integration into automated devices
- Individualized service and support

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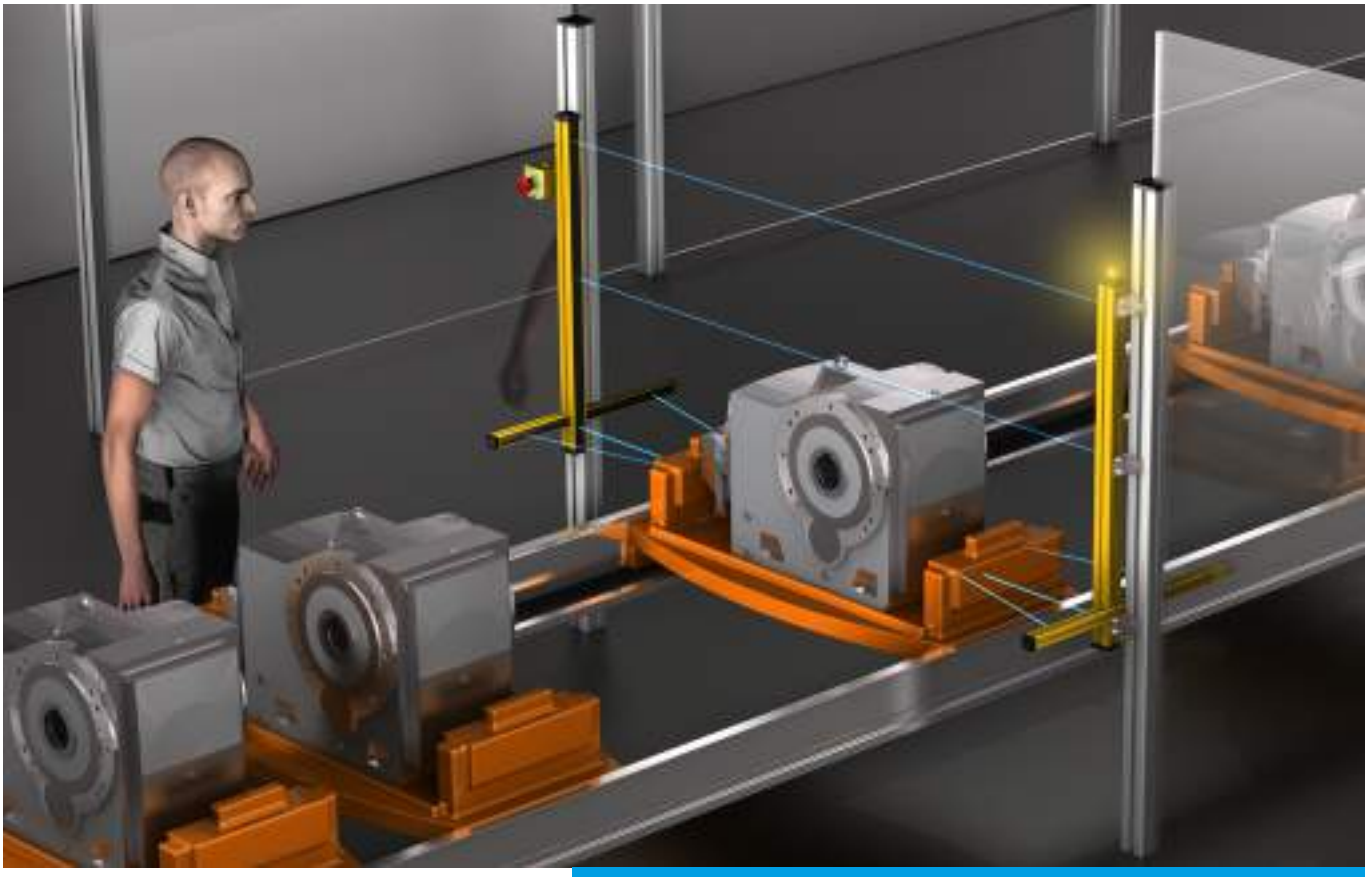
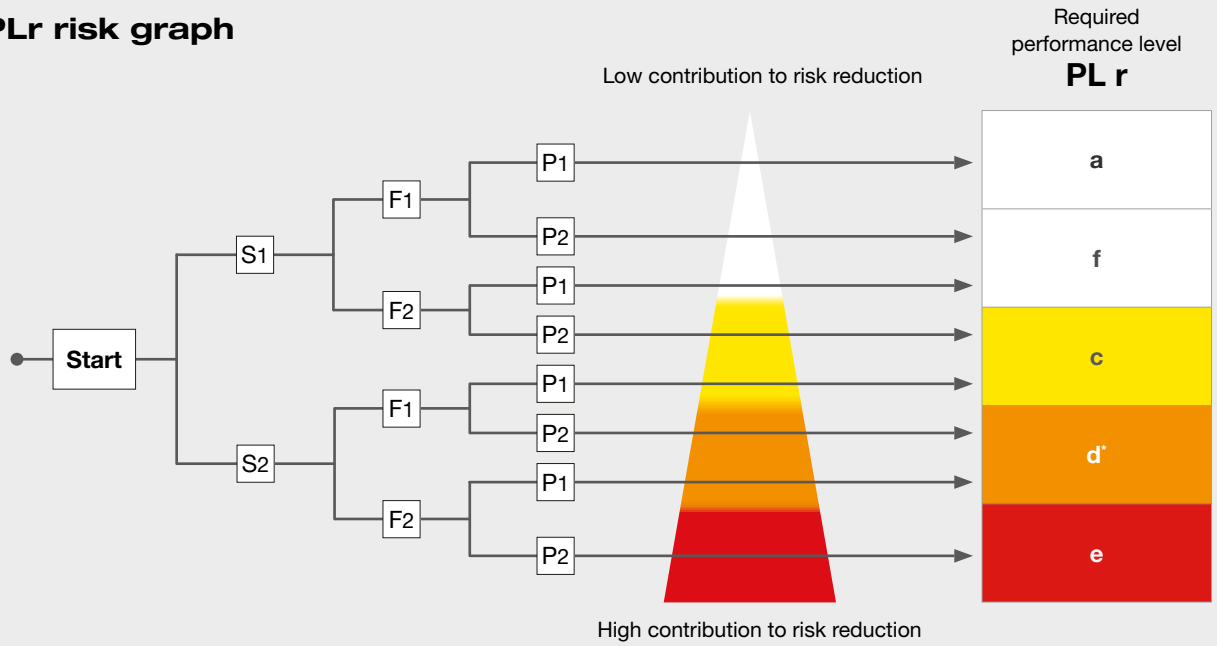
Opto-electronic safety sensors



Our opto-electronic safety sensors are used as electro-sensitive protective equipment where danger zones and hazard areas must be reliably and cost-efficiently safeguarded. The large product range also includes robust and resilient variants for technical safety integration up to the highest level of safety.

PLr risk graph



* If a required performance level PL **d** is necessary, light barriers with a **Type 4** safety level must be used!

S	Injury severity level
S1	Minor injury (usually reversible)
S2	Serious injury (usually irreversible) or death

F	Frequency and/or duration of the exposure to the hazard
F1	Seldom/short
F2	Continuous/prolonged

P	Possibility of hazard prevention or limitation of harm
P1	Possible under certain conditions
P2	Virtually impossible

➔ **Note:** The PLr values are entirely "hierarchical". PLr(e) provides the largest and PLr(a) provides the smallest contribution for risk reduction.

Directives and standards for PL e

Safety light curtains / grids

Type 4 / **Type 4** in accordance with IEC/TS 61496-2
SIL 3 – SILCL 3 in accordance with IEC 61508 - IEC 62061

PL e – Cat. 4 in accordance with ISO 13849-1

- **Corresponds to the following directives and standards:**
- **2006/42/EG** „Machinery Directive“
- **2014/30/EU** „EMC Directive / Directive relating to electromagnetic compatibility“
- **2014/35/EU** „Low Voltage Directive“
- **2011/65/EU** „RoHS Directive“
- **IEC/EN 61496-1** Edition 2.1, **IEC/TS 61496-2** Edition 2 „Electro-sensitive protective equipment“
- **EN ISO 13849-1** „Safety of machinery – Safety-related parts of control systems – General principles for design“
- **IEC/EN 62061 ed .1 ; am1** „Sof machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems“
- **IEC 61508-1, -2, -3, -4 ed.2** „Functional safety of safety-related electrical, electronic and programmable electronic systems“
- **EN 50178: 1997** „Electronic equipment for use in power installations“
- **EN 55022: 2010** „Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement“
- **EN 61000-6-2: 2005** „Electromagnetic compatibility (EMV) - Part 6-2: Generic standards – Immunity for industrial environments“
- **UL (C+US)** for Canada and the USA
- **ANSI / UL 1998** „Safety software in programmable components“

Safety level

TYPE 4

SIL 3 – SILCL 3
PL e – Cat. 4

SELECTION GUIDE FOR SAFETY LIGHT CURTAINS / GRIDS

It is helpful to divide the application of safety light curtains / grids into four groups:


Detection of a finger


Detection of a body in the danger zone


Detection of a finger


Detection of a body during access control

Finger protection	SLB4-...	SLI4-...
Light barrier type	Light curtain	
Safety level	**Type 4 SIL 3 – SILCL 3 PL e – Cat. 4**	
Resolution	14 mm	
Protective field height	160 - 1,810 mm	
Maximum range	6 m	
Start / restart interlock integrated	-	✓
EDM integrated	-	✓
Master/slave versions	-	✓ (Slave / Slave 2)

Hand protection	SLB4-...	SLBH4-...	SLI4-...	SLIH4-...	SLM4-...
Light barrier type	Light curtain				Light curtain with muting lamp
Safety level	**Type 4 SIL 3 – SILCL 3 PL e – Cat. 4**				
Resolution	20 - 30 - 40 mm				30 mm
Protective field height	160 - 1,810 mm				310 - 2,260 mm
Maximum range	12 m	20 m	12 m	20 m	12 m
Start / restart interlock integrated	-	-	✓	✓	✓
EDM integrated	-	-	✓	✓	✓
Master/slave versions	-	-	✓ (Slave / Slave 2)	-	-

Body protection	SLB4-...	SLBH4-...	SLI4-...	SLIH4-...
Light barrier type	Light curtain			
Safety level	**Type 4 SIL 3 – SILCL 3 PL e – Cat. 4**			
Resolution	50 - 90 mm			
Protective field height	160 - 1,810 mm			
Maximum range	12 m	20 m	12 m	20 m
Start / restart interlock integrated	-	-	✓	✓
EDM integrated	-	-	✓	✓
Master/slave versions	-	-	✓ (Slave / Slave 2)	-

Access control	SLB4-xB	SLBH4-xB	SLI4-xB	SLIH4-xB	SLM4-...
Light barrier type	Light grids				Light grid with muting lamp
Safety level	**Type 4 SIL 3 – SILCL 3 PL e – Cat. 4**				
Number of beams	2 - 3 - 4				
Beam separation (axis distance)	300 - 400 - 500 mm				
Protective field height	510 - 810 - 910 mm				–
Maximum range	12 m	20 m	12 m	20 m	12 m
Start / restart interlock integrated	-	-	✓	✓	✓
EDM integrated	-	-	✓	✓	✓
Master/slave versions	-	-	✓ (Slave / Slave 2)	-	-

Glossary

Start / restart interlock:
Locking function when the machine is started or restarted (manual confirmation required).

EDM– External Device Monitoring:
Monitoring of the external switch protection devices using a feedback input.

Master/slave:
Two or three light curtains / grids can be switched in series;
all outputs are managed by only one light curtain/grid (master).

SL-4 SAFETY LIGHT CURTAINS / GRIDS, TYPE 4

With safety level type 4, these safety light curtains / grids cover the highest safety level for finger, hand and body protection or in access control. The compact, slim devices can also be installed in confined space conditions. The master/slave variants as well as a version with integrated control function (EDM) are available as options.

Safety level
TYPE 4
SIL 3 – SILCL 3
PL e – Cat. 4

Technical data (typ.)	+20 °C, 24 V DC
Safety level	**Type 4** in accordance with IEC/TS 61496-2 **SIL 3 – SILCL** 3 in accordance with IEC 61508 - IEC 62061 **PL e – Cat. 4** in accordance with ISO 13849-1
Profile cross section	28 x 30 mm
Safety outputs	PNP (2x), 400 mA, 24 V DC
LED displays	Self-diagnostics Status
Start / restart	Automatic
Service voltage	19.2 to 28.8 V DC
Master connection	M12, 5-pin M12, 8-pin (receiver) (SLB … and SLI …)
Length of connection cable	max. 100 m unshielded
Ambient temperature	-20 to +55 °C
Protection class	IP 65 + IP 67
Protection class	III, operation on protective low voltage
Housing material	Aluminum
Window material	Polycarbonate
Mounting	Rear side, T-groove, or by the use of adjustable brackets SFB E180 (optional)

		Resolution / beam separation	Number of beams	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	SL-4 Safety light curtain / grid	SLB4	SLBH4	SLI4	SLIH4
Special feature									For external safety functions		Integrated safety functions	
Range									up to 6 m		up to 6 m	
	Finger protection 14 mm	15	160	213	4		**Transmitter** CD … **Receiver** CD … / SLI… : C8D		SLB4-151		SLI4-151[1)]	
		30	310	363	5.5				SLB4-301		SLI4-301[1)]	
		45	460	513	7.5				SLB4-451		SLI4-451[1)]	
		60	610	663	9				SLB4-601		SLI4-601[1)]	
		75	760	813	11				SLB4-751		SLI4-751[1)]	
		90	910	963	13				SLB4-901		SLI4-901[1)]	
		105	1,060	1,113	14.5				SLB4-1051		SLI4-1051[1)]	
		120	1,210	1,263	16.5				SLB4-1201		SLI4-1201[1)]	
		135	1,360	1,413	18				SLB4-1351		SLI4-1351[1)]	
		150	1,510	1,563	20				SLB4-1501		SLI4-1501[1)]	
		165	1,660	1,713	22				SLB4-1651		SLI4-1651[1)]	
		180	1,810	1,886	23.5				SLB4-1801		SLI4-1801[1)]	

[1)] see “Note”, page 160

		Resolution / beam separation	Number of beams	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	Product description			
SL-4 Safety light curtain / grid									**SLB4**	**SLBH4**	**SLI4**	**SLIH4**
Special feature									For external safety functions		Integrated safety functions	
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 20 mm	15	160	213	4	**Transmitter** CD… **Receiver** CD… / C8D				SLBH4-152		SLIH4-152
		30	310	363	5.5					SLBH4-302		SLIH4-302
		45	460	513	7.5					SLBH4-452		SLIH4-452
		60	610	663	9					SLBH4-602		SLIH4-602
		75	760	813	11					SLBH4-752		SLIH4-752
		90	910	963	13					SLBH4-902		SLIH4-902
		105	1,060	1,113	14.5					SLBH4-1052		SLIH4-1052
		120	1,210	1,263	16.5					SLBH4-1202		SLIH4-1202
		135	1,360	1,413	18					SLBH4-1352		SLIH4-1352
		150	1,510	1,563	20					SLBH4-1502		SLIH4-1502
		165	1,660	1,713	22					SLBH4-1652		SLIH4-1652
		180	1,810	1,886	23.5					SLBH4-1802		SLIH4-1802
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 30 mm	8	160	213	4	**Transmitter** CD… **Receiver** CD… / C8D			SLB4-153		SLI4-153[1)]	
		13	260	313	5				SLB4-253		SLI4-253[1)]	
		16	310	363	5.4				SLB4-303		SLI4-303[1)]	
		23	460	513	7.5				SLB4-453		SLI4-453[1)]	
		31	610	663	9				SLB4-603		SLI4-603[1)]	
		38	760	813	10.5				SLB4-753		SLI4-753[1)]	
		46	910	963	12.5				SLB4-903		SLI4-903[1)]	
		53	1,060	1,113	14				SLB4-1053		SLI4-1053[1)]	
		61	1,210	1,263	15.5				SLB4-1203		SLI4-1203[1)]	
		68	1,360	1,413	17				SLB4-1353		SLI4-1353[1)]	
		76	1,510	1,563	19				SLB4-1503		SLI4-1503[1)]	
		88	1,660	1,713	20.5				SLB4-1653		SLI4-1653[1)]	
		91	1,810	1,886	22				SLB4-1803		SLI4-1803[1)]	
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 30 mm	8	160	213	3	**Transmitter** CD… **Receiver** CD… / C8D				SLBH4-153		SLIH4-153[1)]
		16	310	363	4					SLBH4-303		SLIH4-303[1)]
		23	460	513	5					SLBH4-453		SLIH4-453[1)]
		31	610	663	6					SLBH4-603		SLIH4-603[1)]
		38	760	813	6.5					SLBH4-753		SLIH4-753[1)]
		46	910	963	7.5					SLBH4-903		SLIH4-903[1)]
		53	1,060	1,113	8.5					SLBH4-1053		SLIH4-1053[1)]
		61	1,210	1,263	9.5					SLBH4-1203		SLIH4-1203[1)]
		68	1,360	1,413	10					SLBH4-1353		SLIH4-1353[1)]
		76	1,510	1,563	11					SLBH4-1503		SLIH4-1503[1)]
		88	1,660	1,713	12					SLBH4-1653		SLIH4-1653[1)]
		91	1,810	1,886	13					SLBH4-1803		SLIH4-1803[1)]

[1)] see “Note”, page 160

		Resolution / beam separation	Number of beams	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	Product description			
SL-4 Safety light curtain / grid								**SLB4**	**SLBH4**	**SLI4**	**SLIH4**
Special feature								For external safety functions		Integrated safety functions	
Range								up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 40 mm	6	160	213	3.5	**Transmitter** CD… **Receiver** CD… / C8D		SLB4-154		SLI4-154[1)]	
		8	260	313	4			SLB4-254		SLI4-254[1)]	
		11	310	363	4.5			SLB4-304		SLI4-304[1)]	
		16	460	513	5.5			SLB4-454		SLI4-454[1)]	
		21	610	663	7			SLB4-604		SLI4-604[1)]	
		26	760	813	8			SLB4-754		SLI4-754[1)]	
		31	910	963	9			SLB4-904		SLI4-904[1)]	
		36	1,060	1,113	10			SLB4-1054		SLI4-1054[1)]	
		41	1,210	1263	11			SLB4-1204		SLI4-1204[1)]	
		46	1,360	1,413	12.5			SLB4-1354		SLI4-1354[1)]	
		51	1,510	1,563	13.5			SLB4-1504		SLI4-1504[1)]	
		56	1,660	1,713	14.5			SLB4-1654		SLI4-1654[1)]	
		61	1,810	1,886	15.5			SLB4-1804		SLI4-1804[1)]	
Range								up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 40 mm	6	160	213	3	**Transmitter** CD… **Receiver** CD… / C8D			SLBH4-154		SLIH4-154[1)]
		11	310	363	3.5				SLBH4-304		SLIH4-304[1)]
		16	460	513	4				SLBH4-454		SLIH4-454[1)]
		21	610	663	4.5				SLBH4-604		SLIH4-604[1)]
		26	760	813	5				SLBH4-754		SLIH4-754[1)]
		31	910	963	6				SLBH4-904		SLIH4-904[1)]
		36	1,060	1,113	6.5				SLBH4-1054		SLIH4-1054[1)]
		41	1,210	1,263	7				SLBH4-1204		SLIH4-1204[1)]
		46	1,360	1,413	7.5				SLBH4-1354		SLIH4-1354[1)]
		51	1,510	1,563	8				SLBH4-1504		SLIH4-1504[1)]
		56	1,660	1,713	8.5				SLBH4-1654		SLIH4-1654[1)]
		61	1,810	1,886	9.5				SLBH4-1804		SLIH4-1804[1)]

[1)] see “Note”, page 160

		Resolution / beam separation	Number of beams	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	Product description			
SL-4 Safety light curtain / grid									**SLB4**	**SLBH4**	**SLI4**	**SLIH4**
Special feature									For external safety functions		Integrated safety functions	
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 50 mm	4	160	213	3	**Transmitter** CD… **Receiver** CD… / C8D			SLB4-155		SLI4-155[1)]	
		8	310	363	4				SLB4-305		SLI4-305[1)]	
		12	460	513	4.5				SLB4-455		SLI4-455[1)]	
		16	610	663	5.5				SLB4-605		SLI4-605[1)]	
		20	760	813	6.5				SLB4-755		SLI4-755[1)]	
		24	910	963	7.5				SLB4-905		SLI4-905[1)]	
		28	1,060	1,113	8.5				SLB4-1055		SLI4-1055[1)]	
		32	1,210	1,263	9				SLB4-1205		SLI4-1205[1)]	
		36	1,360	1,413	10				SLB4-1355		SLI4-1355[1)]	
		40	1,510	1,563	11				SLB4-1505		SLI4-1505[1)]	
		44	1,660	1,713	12				SLB4-1655		SLI4-1655[1)]	
		48	1,810	1,886	13				SLB4-1805		SLI4-1805[1)]	
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Hand protection 50 mm	4	160	213	2.5	**Transmitter** CD… **Receiver** CD… / C8D				SLBH4-155		SLIH4-155[1)]
		8	310	363	3					SLBH4-305		SLIH4-305[1)]
		12	460	513	3.5					SLBH4-455		SLIH4-455[1)]
		16	610	663	4					SLBH4-605		SLIH4-605[1)]
		20	760	813	4.5					SLBH4-755		SLIH4-755[1)]
		24	910	963	5					SLBH4-905		SLIH4-905[1)]
		28	1,060	1,113	5.5					SLBH4-1055		SLIH4-1055[1)]
		32	1,210	1,263	6					SLBH4-1205		SLIH4-1205[1)]
		36	1,360	1,413	6.5					SLBH4-1355		SLIH4-1355[1)]
		40	1,510	1,563	7					SLBH4-1505		SLIH4-1505[1)]
		44	1,660	1,713	7					SLBH4-1655		SLIH4-1655[1)]
		48	1,810	1,886	8					SLBH4-1805		SLIH4-1805[1)]
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Body protection 90 mm	4	310	363	3	**Transmitter** CD… **Receiver** CD… / C8D			SLB4-309		SLI4-309[1)]	
		6	460	513	3.5				SLB4-459		SLI4-459[1)]	
		8	610	663	4				SLB4-609		SLI4-609[1)]	
		10	760	813	4.5				SLB4-759		SLI4-759[1)]	
		12	910	963	5				SLB4-909		SLI4-909[1)]	
		14	1,060	1,113	5.5				SLB4-1059		SLI4-1059[1)]	
		16	1,210	1,263	5.5				SLB4-1209		SLI4-1209[1)]	
		18	1360	1,413	6				SLB4-1359		SLI4-1359[1)]	
		20	1,510	1,563	6.5				SLB4-1509		SLI4-1509[1)]	
		22	1,660	1,713	7				SLB4-1659		SLI4-1659[1)]	
		24	1,810	1,886	7.5				SLB4-1809		SLI4-1809[1)]	

[1)] see “Note”, page 160

		Resolution / beam separation	Number of beams	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	Product description			
SL-4 Safety light curtain / grid									**SLB4**	**SLBH4**	**SLI4**	**SLIH4**
Special feature									For external safety functions		Integrated safety functions	
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	Body protection 90 mm	4	310	363	2.5	**Transmitter** CD… **Receiver** CD… / C8D				SLBH4-309		SLIH4-309[1)]
		6	460	513	3					SLBH4-459		SLIH4-459[1)]
		8	610	663	3					SLBH4-609		SLIH4-609[1)]
		10	760	813	3.5					SLBH4-759		SLIH4-759[1)]
		12	910	963	3.5					SLBH4-909		SLIH4-909[1)]
		14	1,060	1,113	3.5					SLBH4-1059		SLIH4-1059[1)]
		16	1,210	1,263	4					SLBH4-1209		SLIH4-1209[1)]
		18	1,360	1,413	4					SLBH4-1359		SLIH4-1359[1)]
		20	1,510	1,563	4.5					SLBH4-1509		SLIH4-1509[1)]
		22	1,660	1,713	4.5					SLBH4-1659		SLIH4-1659[1)]
		24	1,810	1,886	5					SLBH4-1809		SLIH4-1809[1)]
Range									up to 12 m	up to 20 m	up to 12 m	up to 20 m
	500	2	510	653	2.5	**Transmitter** CD… **Receiver** CD… / SLI… : C8D			SLB4-2B		SLI4-2B[1)]	
	400	3	810	953	3				SLB4-3B		SLI4-3B[1)]	
	300	4	910	1,053	3				SLB4-4B		SLI4-4B[1)]	
	500	2	510	653	2.5	**Transmitter** CD… **Receiver** CD… / SLI… : C8D				SLBH4-2B		SLIH4-2B[1)]
	400	3	810	953	2.5					SLBH4-3B		SLIH4-3B[1)]
	300	4	910	1,053	2.5					SLBH4-4B		SLIH4-4B[1)]

[1)] see “Note”, page 160

Note

[1)] Light curtains / grids are also available as a variant in a protective housing.

SLI… -WTF (IP 69K)

SLI… -WTHF (IP 69K, heated)

SL-4 Master/slave models with integrated control functions

Technical data (typ.)	+20 °C, 24 V DC
Safety level	**Type 4** in accordance with IEC/TS 61496-2 **SIL 3 – SILCL** 3 in accordance with IEC 61508 - IEC 62061 **PL e – Cat. 4** in accordance with ISO 13849-1
Profile cross section	28 x 30 mm
Safety outputs (master)	PNP (2x), 400 mA, 24 V DC
LED displays	Self-diagnostics Status
Start / restart (master)	Automatic or manual (selectable)
External relay (device) monitoring - EDM (master models)	Feedback input, selectable release
Service voltage	19.2 to 28.8 V DC
Master connection	M12, 5-pin (transmitter) M12, 8-pin (receiver)
Master / slave 2 / slave connection	M12, 5-pin (transmitter and receiver)
Length of connection cable	max. 100 m unshielded
Length of connection cable	max. 50 m unshielded (between master/slave)
Ambient temperature	-20 to +55 °C
Protection class	IP 65 + IP 67
Protection class	III, operation on protective low voltage
Housing material	Aluminum
Window material	Polycarbonate
Mounting	Rear side, T-groove, or by the use of adjustable brackets SFB E180 (optional)

		Resolution / beam separation	Number of beams (mm)	Protective field height (mm)	Total height: Master / slave 2 (mm)	Total height: Slave (mm)	Conf. range: Low Range to (m)	Conf. range: High Range to (m)	Product description: Master	Product description: Slave	Product description: Slave 2
SL-4 Safety light curtain / grid									**Master**	**Slave**	**Slave 2**
	Finger protection 14 mm	15	160	-	213	3	6		SLI4-151-S		
		30	310	387	363				SLI4-301-M	SLI4-301-S	SLI4-301-S2
		45	460	537	513				SLI4-451-M	SLI4-451-S	SLI4-451-S2
		60	610	687	663				SLI4-601-M	SLI4-601-S	SLI4-601-S2
		75	760	837	813				SLI4-751-M	SLI4-751-S	SLI4-751-S2
		90	910	987	963				SLI4-901-M	SLI4-901-S	SLI4-901-S2
		105	1,060	1,137	1,113				SLI4-1051-M	SLI4-1051-S	SLI4-1051-S2
		120	1,210	1,287	1,263				SLI4-1201-M	SLI4-1201-S	SLI4-1201-S2
		135	1,360	1,437	1,413				SLI4-1351-M	SLI4-1351-S	SLI4-1351-S2
		150	1,510	1,587	1,563				SLI4-1501-M	SLI4-1501-S	SLI4-1501-S2
		165	1,660	1,737	1,713				SLI4-1651-M	SLI4-1651-S	SLI4-1651-S2
		180	1,810	1,910	1,886				SLI4-1801-M	SLI4-1801-S	SLI4-1801-S2
	Hand protection 30 mm	8	160	-	213	4	12			SLI4-153-S	
		13	260	337	313				SLI4-253-M	SLI4-253-S	SLI4-253-S2
		16	310	387	363				SLI4-303-M	SLI4-303-S	SLI4-303-S2
		23	460	537	513				SLI4-453-M	SLI4-453-S	SLI4-453-S2
		31	610	687	663				SLI4-603-M	SLI4-603-S	SLI4-603-S2
		38	760	837	813				SLI4-753-M	SLI4-753-S	SLI4-753-S2
		46	910	987	963				SLI4-903-M	SLI4-903-S	SLI4-903-S2
		53	1,060	1,137	1,113				SLI4-1053-M	SLI4-1053-S	SLI4-1053-S2
		61	1,210	1,287	1,263				SLI4-1203-M	SLI4-1203-S	SLI4-1203-S2
		68	1,360	1,437	1,413				SLI4-1353-M	SLI4-1353-S	SLI4-1353-S2
		76	1,510	1,587	1,563				SLI4-1503-M	SLI4-1503-S	SLI4-1503-S2
		88	1,660	1,737	1,713				SLI4-1653-M	SLI4-1653-S	SLI4-1653-S2
		91	1,810	1,910	1,886				SLI4-1803-M	SLI4-1803-S	SLI4-1803-S2

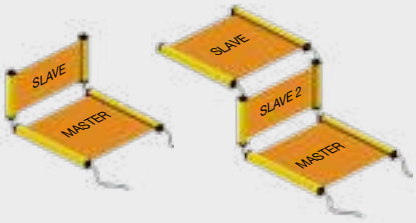
	Resolution / beam separation	Number of beams (mm)	Protective field height (mm)	Total height: Master / slave 2 (mm)	Total height: Slave (mm)	Conf. range: Low Range to (m)	Conf. range: High Range to (m)	Product description: Master	Product description: Slave	Product description: Slave 2
SL-4 Safety light curtain / grid										
	Hand protection 40 mm	6	160	-	213	4	12		SLI4-154-S	
		8	260	337	313			SLI4-254-M	SLI4-254-S	SLI4-254-S2
		11	310	387	363			SLI4-304-M	SLI4-304-S	SLI4-304-S2
		16	460	537	513			SLI4-454-M	SLI4-454-S	SLI4-454-S2
		21	610	687	663			SLI4-604-M	SLI4-604-S	SLI4-604-S2
		26	760	837	813			SLI4-754-M	SLI4-754-S	SLI4-754-S2
		31	910	987	963			SLI4-904-M	SLI4-904-S	SLI4-904-S2
		36	1,060	1,137	1,113			SLI4-1054-M	SLI4-1054-S	SLI4-1054-S2
		41	1,210	1,287	1,263			SLI4-1204-M	SLI4-1204-S	SLI4-1204-S2
		46	1,360	1,437	1,413			SLI4-1354-M	SLI4-1354-S	SLI4-1354-S2
		51	1,510	1,587	1,563			SLI4-1504-M	SLI4-1504-S	SLI4-1504-S2
		56	1,660	1,737	1,713			SLI4-1654-M	SLI4-1654-S	SLI4-1654-S2
		61	1,810	1,910	1,886			SLI4-1804-M	SLI4-1804-S	SLI4-1804-S2
	Body protection 50 mm	4	160	-	213	4	12		SLI4-155-S	
		8	310	387	363			SLI4-305-M	SLI4-305-S	SLI4-305-S2
		12	460	537	513			SLI4-455-M	SLI4-455-S	SLI4-455-S2
		16	610	687	663			SLI4-605-M	SLI4-605-S	SLI4-605-S2
		20	760	837	813			SLI4-755-M	SLI4-755-S	SLI4-755-S2
		24	910	987	963			SLI4-905-M	SLI4-905-S	SLI4-905-S2
		28	1,060	1,137	1,113			SLI4-1055-M	SLI4-1055-S	SLI4-1055-S2
		32	1,210	1,287	1,263			SLI4-1205-M	SLI4-1205-S	SLI4-1205-S2
		36	1,360	1,437	1,413			SLI4-1355-M	SLI4-1355-S	SLI4-1355-S2
		40	1,510	1,587	1,563			SLI4-1505-M	SLI4-1505-S	SLI4-1505-S2
		44	1,660	1,737	1,713			SLI4-1655-M	SLI4-1655-S	SLI4-1655-S2
		48	1,810	1,910	1,886			SLI4-1805-M	SLI4-1805-S	SLI4-1805-S2
	Body protection 90 mm	4	310	387	363	4	12	SLI4-309-M	SLI4-309-S	SLI4-309-S2
		6	460	537	513			SLI4-459-M	SLI4-459-S	SLI4-459-S2
		8	610	687	663			SLI4-609-M	SLI4-609-S	SLI4-609-S2
		10	760	837	813			SLI4-759-M	SLI4-759-S	SLI4-759-S2
		12	910	987	963			SLI4-909-M	SLI4-909-S	SLI4-909-S2
		14	1,060	1,137	1,113			SLI4-1059-M	SLI4-1059-S	SLI4-1059-S2
		16	1,210	1,287	1,263			SLI4-1209-M	SLI4-1209-S	SLI4-1209-S2
		18	1,360	1,437	1,413			SLI4-1359-M	SLI4-1359-S	SLI4-1359-S2
		20	1,510	1,587	1,563			SLI4-1509-M	SLI4-1509-S	SLI4-1509-S2
		22	1,660	1,737	1,713			SLI4-1659-M	SLI4-1659-S	SLI4-1659-S2
		24	1,810	1,910	1,886			SLI4-1809-M	SLI4-1809-S	SLI4-1809-S2
Beams 2-3-4 	500	2	510	677	653	4	12	SLI4-2B-M	SLI4-2B-S	SLI4-2B-S2
	400	3	810	977	953			SLI4-3B-M	SLI4-3B-S	SLI4-3B-S2
	300	4	910	1,077	1,053			SLI4-4B-M	SLI4-4B-S	SLI4-4B-S2

Function of master/slave models

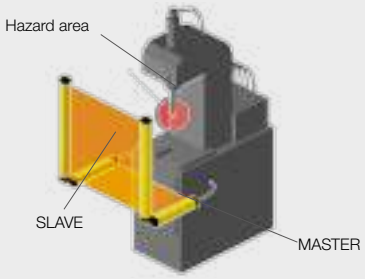
The master/slave model makes it possible to switch up to three light curtains / grids in series and to have combined detection of hands and body, or to simultaneously monitor various sides of the machine. With the following critical advantages:

- Only one pair of safety outputs
- No interference between light barriers installed in adjacent spaces

Examples for series connection of master/slave models

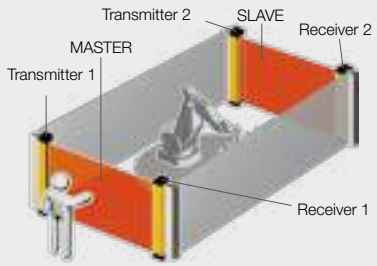


It is possible to connect any master model to any slave model. All electrical connections are designed with 5-pin M12 connectors, with the exception of the master receiver, which requires an 8-pin M12 connector.
For the connection between master and slave, cables prefabricated with 2 connectors are available (see page 186).



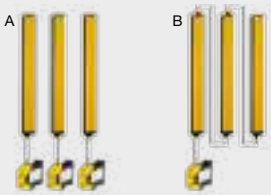
The master is positioned horizontally for the detection of a body, while the vertical slave takes over the detection of hands.
You can also turn the connection and position the master vertically for the protection of hands and the slave horizontally for the detection of the body.
The application pictured here is among the most common:
Horizontal safety light curtains / grids are used for preventing the operator from going undetected if he or she remains between the vertical light curtain/grid and the dangerous machine when turning it on or restarting it.

Example of series connection of master/slave models for protecting two sides of a machine



In the case of safety light curtains / grids SLI, a (non-shielded) standard cable is used for the connection between master and slave. It can have a length of up to 50 meters (see page 186).
This property allows for the use of 2 light curtains / grids switched in series, whereby one of them is positioned at the front and the other at the rear side of the machine, with only one connection for the power supply and the control circuit of the machine.
Up to 3 safety light curtains / grids switched in series are possible.

Advantage when using master/slave series connections



A schematic of the series connection:
For three standard light curtains / grids, 3 safety modules or 6 relays have to be used and cabled.

B For the master/slave solution with 3 light curtains / grids switched in series, it is possible to use and cable only 1 safety module or 2 relays.

Formulas for calculating the total response time in the case of master/slave series connections SLI4-...:

For a resolution of 14 mm	Master + Slave	$t_{tot} = [0.06 \times (No._{Master} + No._{Slave}) + 0.9636] \times 2$
	Master + Slave 2 + Slave	$t_{tot} = [0.06 \times (No._{Master} + No._{Slave\,2} + No._{Slave}) + 1.0036] \times 2$
For all other resolutions or beam separations	Master + Slave	$t_{tot} = [0.11 \times (No._{Master} + No._{Slave}) + 0.9376] \times 2$
	Master + Slave 2 + Slave	$t_{tot} = [0.11 \times (No._{Master} + No._{Slave\,2} + No._{Slave}) + 1.0508] \times 2$

Key t_{tot} = Total response time No. = Number of beams for the selected model

SL-4M MUTING SAFETY LIGHT CURTAINS / GRIDS, TYPE 4

Type4 Muting SL-4M safety light curtains / grids meet the requirements for the highest safety level Type 4 and permanent personal protection is ensured with unhindered material feed. Additional external muting sensors can be connected to devices with integrated muting function. Ready-to-install muting arms can be added to the modular system.

Technical data (typ.)	+20 °C, 24 V DC
Safety level	**Type 4** in accordance with TS 61496-2 **SIL 3 – SILCL 3** in accordance with IEC 61508 - IEC 62061 **PL e – Cat. 4** in accordance with ISO 13849-1
Profile cross section	50 x 55 mm
Safety outputs	PNP (2x), 400 mA, 24 V DC
LED displays	Self-diagnostics Status
Start / restart	Automatic or manual (selectable)
External device (relay) monitoring - EDM	Feedback input, selectable release
Service voltage	19.2 to 28.8 V DC
Connection (transmitter)	M12, 5-pin (main plug) M12, 5-pin (2x, muting sensors)
Connection (receiver)	M12, 12-pin (main plug) M12, 5-pin (2x, muting sensors) M12, 5-pin (muting light SL-4M, SL-4MO) configuration M12, 5-pin (configuration SL-4MPO)
Length of connection cable	max. 100 m unshielded
Ambient temperature	-30 to +55 °C
Protection class	IP 65 + IP 67
Protection class	III, operation on protective low voltage
Housing material	Aluminum
Window material	Polycarbonate
Mounting	T-groove (mounting bracket in scope of delivery)

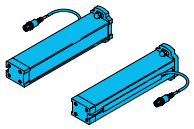
SL-4M Muting safety light curtains / grids, type 4		Resolution / beam separation (mm)	Number of beams	Beam separation (mm)	Protective field height (mm)	Total height (mm)	Response time (ms)	Connection cable (optionally available)	SLM4	SLM4O	SLM4PO
Special feature										with status indicator	with status indicator and programmable
Range										up to 12 m	
	Detection of a body during access control	2	500		685	5.5		Receiver (main plug) CS12D… (Muting lamp) CD… (Configuration) CS12USB	SLM4-2B		
		3	400		985	5.5			SLM4-3B		
		4	300		1,085	5.5			SLM4-4B		
		2	500		710	5.5				SLM4O-2B	SLM4PO-2B
		3	400		1,010	5.5				SLM4O-3B	SLM4PO-3B
		4	300		1,110	5.5				SLM4O-4B	SLM4PO-4B
	Hand protection 30 mm	16		310	420	8.0		Receiver (main plug) CS12D... (Configuration) CS12USB			SLM4PO-303
		23		460	570	9.5					SLM4PO-453
		31		610	720	11.0					SLM4PO-603
		38		760	870	12.5					SLM4PO-753
		46		910	1,020	14.5					SLM4PO-903
		53		1,060	1,170	16.0					SLM4PO-1053
		61		1,210	1,320	17.6					SLM4PO-1203
		68		1,360	1,470	19.0					SLM4PO-1353
		76		1,510	1,620	20.5					SLM4PO-1503
		83		1,660	1,770	22.0					SLM4PO-1653
		91		1,810	1,920	23.5					SLM4PO-1803
		98		1,960	2,070	25.0					SLM4PO-1953
		106		2,110	2,220	26.5					SLM4PO-2103
		113		2,260	2,370	28.0					SLM4PO-2253

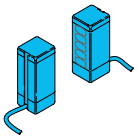
MA… / MZ MUTING ARMS

The muting arms MA .../MZ can be directly mounted on and connected to the safety light grids/curtains SL-4M. Multiple muting functions can be implemented thanks to simple hardwire wiring. Even perforated objects, such as pallets, can be detected with the MZ multibeam light barriers.

Technical data (typ.)	**+20 °C, 24 V DC**
Emitted light	Infrared
Service voltage	19.2 to 28.8 V DC
Switching output	pnp, 100 mA, NO
Ambient temperature	-30 to +55 °C

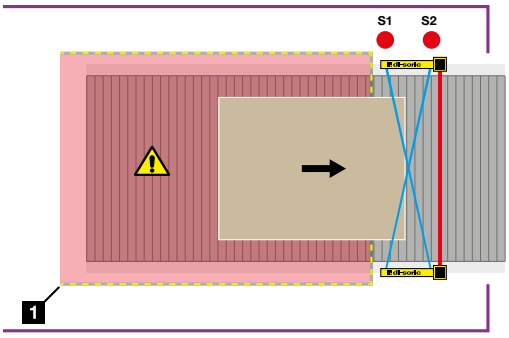
CE

	Muting arm design	Number of muting sensors in set	Parallel (P) or Cross-muting (X)	Range (m)	Operating principle: Through-beam sensor	Retroreflective sensor	Through-beam sensor, 5-beam [1]	Transparent detection, Reduced sensitivity	For high speed belts, with longer muting arms	Safety functions Muting activation	Height adjustable	Adjustment: Rotary position adjustable	IR light	Product description
MA… / MZ Muting arms														
	L	2	X	1 to 2.5	■					■	■		■	MA-L2X
	L	2	P	0 to 3.5		■				■	■		■	MA-L2P-TRX
	L	2	P	0 to 2		■		■		■	■		■	MA-L2P-TRX-G
	L	2	P	0 to 3.5		■			■	■	■		■	MA-L2P-TRX-V
	T	2	X	1 to 2.5	■					■	■		■	MA-T2X
	T	4	P	0 to 3.5		■				■	■		■	MA-T4P-TRX
	T	4	P	0 to 2		■		■		■	■		■	MA-T4P-TRX-G
	T	4	P	0 to 3.5		■			■	■	■		■	MA-T4P-TRX-V
	L	2	X / P	0 to 3.5			■			■	■	■	■	MZ-L2XP
	L	2	P	0 to 3.5			■		■	■	■	■	■	MZ-L2XP-V
	T	2	X	0 to 3.5			■			■	■	■	■	MZ-T2X
	T	4	P	0 to 3.5			■			■	■	■	■	MZ-T4P
	T	4	P	0 to 3.5			■		■	■	■	■	■	MZ-T4P-V

	Housing design Size (mm)	Beam separation (mm)	Number of beams	Operating voltage (VDC)	Response time (ms)	Switching output	Protection class	Ambient temperature (°C)	Cable length, plug connector	Product description
Through-beam light barriers 5-beam [1]										
	70 x 28 x 30	10	5	24±20%	100	PNP, 100 mA,	IP 65	-30 to 55	0,9 m M12, 5-pin	M5-A
	70 x 28 x 30	10	5	24±20%	100	PNP, 100 mA,	IP 65	-30 to 55	0,9 m M12, 5-pin	M5-B

[1] For pallet machines that work with irregular loads and pallets

L2X Muting arms with two crossed muting sensors, material transport out of the danger zone

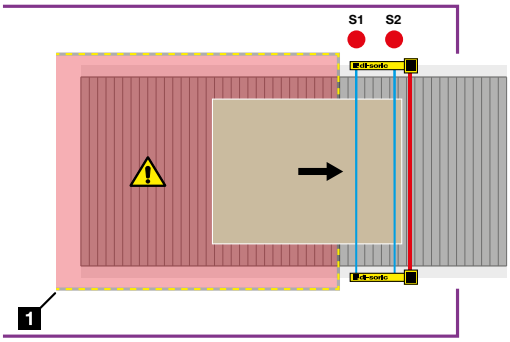


In this muting mode, the two muting arms are located in front of the vertically mounted safety light barrier, facing the danger zone, and are in front of the hazardous passageway.

This unidirectional mode is used for transporting material out of the danger zone

1 = Danger zone

L2P with two crossed muting sensors, material transport out of the danger zone

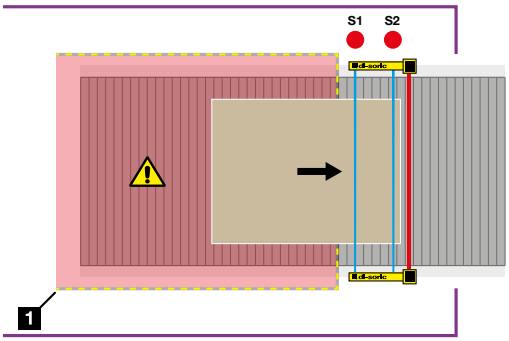


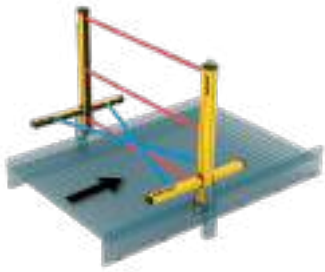
In this muting mode, sensors 1 and 2 are on the same side of the vertical safety light barrier and are in front of the hazardous passageway.

This unidirectional mode is used for protecting material outputs.

1 = Danger zone

T2X with two crossed muting sensors, material transport into and out of the danger zone



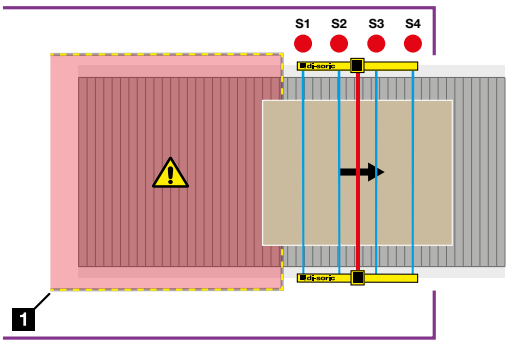


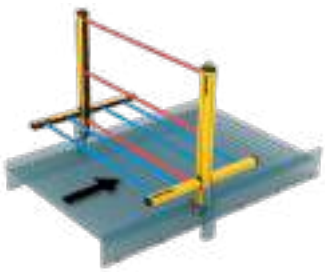
In this muting mode, one sensor (S1) is located on the side of the vertically oriented safety light barrier facing the danger zone. The second sensor (S2) is located on the side facing away from the danger zone.

This bidirectional mode is used for transporting material out of and into the danger zone.

1 = Danger zone

T4P with four parallel muting sensors, material transport into and out of the danger zone



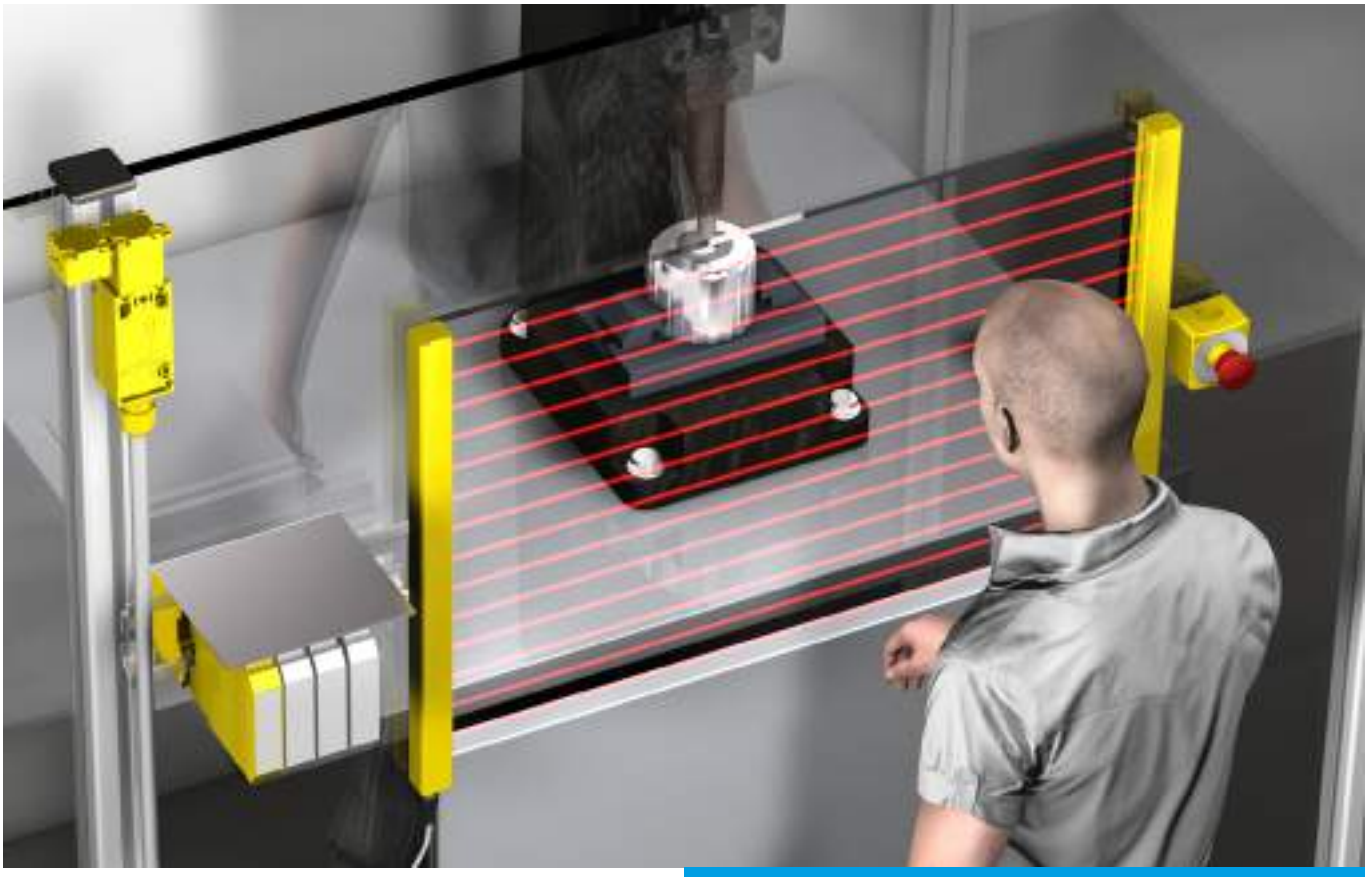


In this muting mode, two sensors are located on one side of the vertical safety light barrier and two are located on the other side.

This bidirectional mode is used for transporting material out of and into the danger zone.

1 = Danger zone

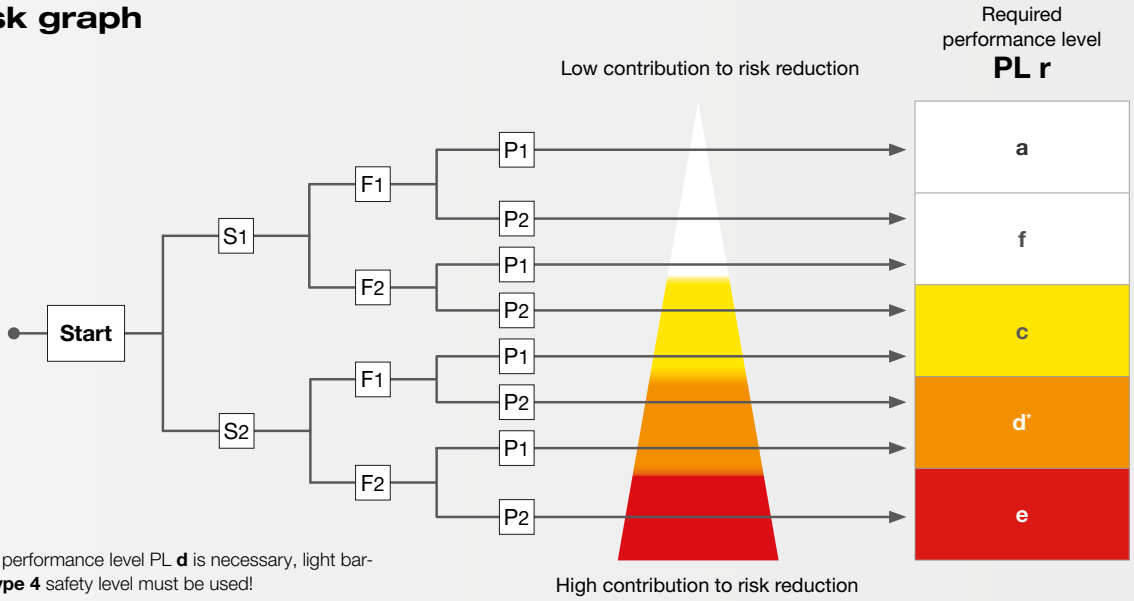
Reliable control components



di-soric

di-soric features various secure control components in its product range with which safety sensors can be integrated into work safety solutions. The result is ideal protection with a high degree of machine availability.

PLr risk graph



* If a required performance level PL **d** is necessary, light barriers with a **Type 4** safety level must be used!

S	Injury severity level
S1	Minor injury (usually reversible)
S2	Serious injury (usually irreversible) or death

F	Frequency and/or duration of the exposure to the hazard
F1	Seldom/short
F2	Continuous/prolonged

P	Possibility of hazard prevention or limitation of harm
P1	Possible under certain conditions
P2	Virtually impossible

➔ **Note:** The PLr values are entirely „hierarchical“. PLr(e) provides the largest and PLr(a) provides the smallest contribution for risk reduction.

Directives and standards for PL e

MODSI– Modular safety system

Type 4 / **Type 4** in accordance with IEC/TS 61496-2
SIL 3 – SILCL 3 in accordance with IEC 61508 - IEC 62061

PL e – Cat. 4 in accordance with ISO 13849-1

- **Corresponds to the following directives and standards:**
- **2006/42/EG** “Machinery Directive”
- **2014/30/EU** “EMC Directive / Directive relating to electromagnetic compatibility”
- **2014/35/EU** “Low Voltage Directive”
- **CEI EN 61131-2** “Programmable controllers, Part 2: Equipment requirements and tests”
- **EN ISO 13849-1** “Safety of machinery - Safety-related parts of control systems - General principles for design”
- **EN ISO 13849-2** “Safety of machinery: Safety-related parts of control systems - Part 2: Validation”
- **IEC/EN 61496-1** “Safety of machinery: Electro-sensitive protective equipment - Part 1: General requirements and tests”
- **IEC/EN 62061** “Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems”
- **IEC 61508-1** “Functional safety of safety-related electrical, electronic and programmable electronic control systems - Part 1: General requirements”
- **IEC 61508-2** “Functional safety of safety-related electrical, electronic and programmable electronic control systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems""
- **IEC 61508-3** “Functional safety of safety-related electrical, electronic and programmable electronic control systems - Part 3: Software requirements“
- **IEC 61508-4** “Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations“
- **IEC 61784-3** “Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses– General rules and profile definitions”
- **UL (C+US)** for Canada and the USA
- **ANSI / UL 1998** „Safety software in programmable components“

Safety level
TYPE 4
SIL 3 – SILCL 3
PL e – Cat. 4

SR SAFETY RELAY / SWITCHING DEVICES

The safety relay / safety switching devices from di-soric make simple integration of individual safety sensors into occupational safety solutions possible. di-soric can optionally also deliver devices with integrated control function (External Device Monitoring - EDM) or with integrated muting function, to which additional external muting sensors can be connected.

Technical data (typ.)	**+20 °C, 24 V DC**
Reaction time	< 20 ms
Service voltage	19.2 to 28.8 V DC
Connection	to terminal strip
Ambient temperature	0 to +55 °C
Protection class	IP 20 for housing IP 2X for terminal strip
Mounting	on top-hat rail in accordance with EN 50022-35 standard

	Dimensions (mm)	*Integrated muting function*	*Start / restart [1] (Automatic or manual (selectable on terminal strip), interlock)*	*External device (relay) monitoring - EDM (Feedback input, selectable release)*	*Two-channel inputs for safety light curtains / grids*	*Outputs safety relay (2 A, 250 VAC)*	*Status output (PNP (1x), 100 mA, 24 V DC)*	*Inputs for muting sensors 2x, 24 VDC, PNP, dark-on, NO*	*Input for muting release 24 V DC, PNP or relay*		*Product description*
Safety relay for safety light curtains / grids type 2 and type 4											
	99 x 22.5 x 114.5		■	■	1	NO (2x)	■				SR-1
	99 x 35 x 114.5	■	■	■	1	NO (2x)	■	■	■		SR-M

[1] Reliable control of the Start / Restart command in accordance with the IEC 61496-1 standard

Interface relay for safety light curtains / grids SLI...											
	101 x 35 x 120					NO (2x) NC (1x) [2]					SR-0

[2] Each NO safety switching output is interrupted twice by the two relays

MODSI SAFETY CONTROL SYSTEM

The modular and configurable MODSI safety system can monitor and control various safety equipment in parallel, including safety light curtains / grids, mechanical switches, floor mats, emergency stop switches and two-hand circuits, as well as combinations of these. Using expansion modules, MODSI can be individually adapted to the respective safety requirements.

Technical data (typ.)	+20 °C, 24 V DC
Safety level	**TYPE 4** in accordance with IEC/TS 61496-1, -2 **SIL 3 – SILCL 3** in accordance with IEC 61508 - IEC 62061 **PL e – Cat. 4** in accordance with ISO 13849-1
Service voltage	19.2 to 28.8 V DC
Connections	Removable terminal strips, screw contacts
Ambient temperature	-10 to +55 °C
Storage temperature	-10 to +85 °C
Protection class	IP20 for housing, IP2X for terminal strip
Mounting	on top-hat rail in accordance with EN 50022-35 standard
Dimensions - H x L x D	99 x 22.5 x 114.5 mm

MODSI

Compact design

MS-M
Configuration Memory

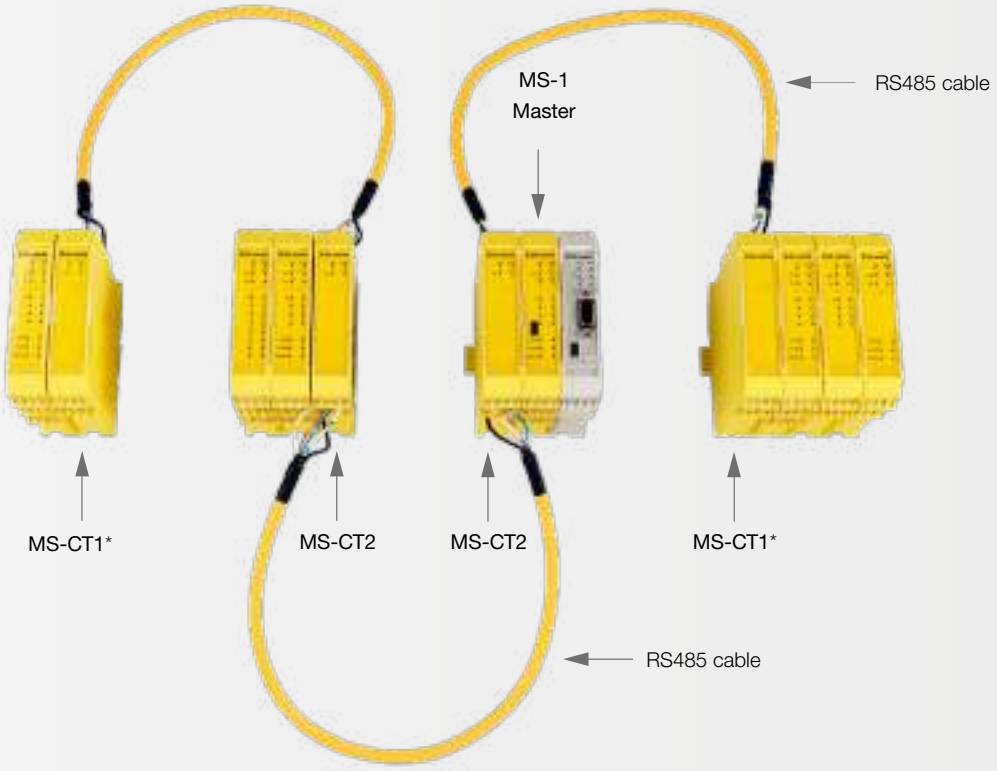
MS-SC
Safety Communication

- Compact design: Design size of each individual module 22.5 x 99 x 114.5 mm
- Removable terminal strips, screw contacts
- Can be used with the most common safety sensors
- Data transmission possible over fieldbus systems
- MS-SD - Safety Designer
  – Simple and intuitive software with a graphical user interface
- A large selection of safety functions
  and logical operators that can be configured using the software (starting on page 51)
- MS-M - Configuration Memory
  – Removable memory card for backing up and transferring configuration data
- MS-SC - Safety Communication
  – Communication between the modules over a 5-way high-speed bus
- Max. 14 expansion modules in addition to the M1 master
- Max. 128 inputs and 16 OSSD safety outputs (pairs)
- Remote maintenance/control of the MS expansion modules is possible over the MS-SC bus (a range of up to 100 m)
- Digital safety inputs that can be programmed individually or in pairs with the option for monitoring using dedicated output signals
- Filters and delays can be programmed separately for each input
- Delays can be programmed for output activation and deactivation
- Independent control of output pairs possible
- Programmable diagnostic output signals
- Easy diagnostics using LED displays on the front side and the bus expansion modules as well as configuration software MS-SD

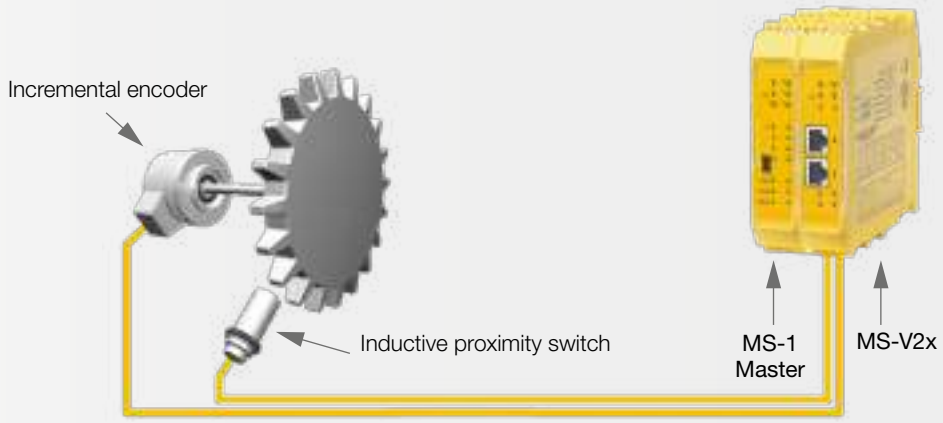
	USB connection	MS-M card slot	Connection to MS-SC bus	MS-SC connector including	Safety inputs	PNP safety outputs, 400 mA OSSD (number of pairs)	PNP signal outputs, 100 mA (programmable)	Test outputs	Safety relay outputs: NO (2x) NC (1x) 6A 250 VAC	NO (4x) NC (2x) 6A 250 VAC	Inputs for start / restart and external device monitoring (EDM)	LED display	Product description
Main module MS-1 for the modular safety system MODSI													
	■	■	■	–	8	2	2	4	–	–	2	Status input/output interference diag-nosis	MS-1
Expansion module MS-... for the modular safety system MODSI													
	–	–	■	■	8	2	2	4	–	–	2	Status input/output interference diag-nosis	MS-I8-02
	–	–	■	■	8	–	–	4	–	–	–		MS-I8
	–	–	■	■	16	–	–	4	–	–	–		MS-I16
	–	–	■	■	12	–	–	8	–	–	–		MS-I12-T8
	–	–	■	■	–	2	2	–	–	–	2		MS-O2
	–	–	■	■	–	4	4	–	–	–	4		MS-O4
	–	–	–	–	–	–	–	–	■	–	1	Output status	MS-R2
	–	–	–	–	–	–	–	–	■	–	2		MS-R4
	–	–	■	■	–	–	–	–	–	■	4		MS-OR4
	–	–	■	■	–	–	8	–	–	■	4		MS-OR4-S8
Expansion modules MS-Vx ... for safety speed monitoring													
	–	–	■	■	1 – 4	Inputs: 2 for PNP/NPN inductive proximity switches						Status input Interference diag-nosis	MS-V0
	–	–	■	■		Inputs: 1 TTL incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V1T
	–	–	■	■		Inputs: 1 HTL incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V1H
		–	■	■		Inputs: 1 sin/cos incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V1S
		–	■	■		Inputs: 1- 2 TTL incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V2T
	–	–	■	■		Inputs: 1- 2 HTL incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V2H
	–	–	■	■		Inputs: 1- 2 sin/cos incremental encoder + 1- 2 induct. PNP/NPN proximity switch							MS-V2S
Expansion modules MS-Bx... for bus diagnosis and data transmission													
	■	–	■	■	Profibus DP - expansion module							Error diagnostics	MS-BP
	■	–	■	■	DeviceNET - expansion module								MS-BD
	■	–	■	■	CANopen - expansion module								MS-BC
	■	–	■	■	Ethernet IP - expansion module								MS-BEI
	■	–	■	■	EtherCAT - expansion module								MS-BEC
	■	–	■	■	PROFINET - expansion module								MS-BEP
	■	–	■	■	Universal Serial Bus - expansion module								MS-BU
Interface modules MS-CTx for connecting exported expansion modules via the MS-SC Bus													
	–	–	■	■	Interface with 1 connection * (1 input or 1 output)							Output status	MS-CT1
	–	–	■	■	Interface with 2 connections (1 input and 1 output)								MS-CT2
Configuration memory for main module													
													MS-M
Safety communication for main/expansion module													
													MS-SC

* End or start of the network

Connection variant with MS-CTx



Connection variant with MS-Vx



Technical characteristics Page 171

* End or start of the network

Lighting for industrial image processing

di-soric

These lighting systems are used for contrast amplification in image-processing applications. The product range includes solutions for an extremely wide range of lighting scenarios, including area, bar, spot, ring, coaxial, dark field and dome lighting systems. The products are distinguished by various color temperatures, a high protection class, load-free trigger and trigger inversion.

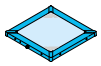
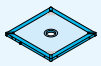
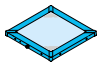
BE-F AREA LIGHTS

Area lights with switchable constant light are suited for operation using a 24 V DC voltage source. They offer a constant light intensity across a wide voltage range.

Technical data (typ.)	**+20 °C, 24 V DC**
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Plug connector	M12
Connection cable	VK… (optionally available)

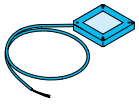
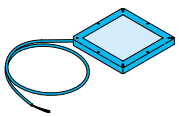
CE

	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Light intensity can be adjusted	Trigger	Protection class	Housing material	Light color	Product description
BE-F Area lights with switchable constant light												
	30 x 30	–	30 x 30 x 20	24	0 to +40				IP 67	Aluminum Black Anodized	Red	BE-F30/30RL-G1-K-BS
											White	BE-F30/30RL-G5-K-BS
	50 x 50	–	50 x 50 x 20	24	0 to +40				IP 67	Aluminum Black Anodized	Red	BE-F50/50RL-G1-K-BS
											White	BE-F50/50RL-G5-K-BS
	50 x 50	–	80 x 110 x 15	15 to 35	0 to +50	■	■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-F50/50-G0TI-IBS
				15 to 35							Red	BEK-F50/50-G1TI-IBS
				18 to 35							Green	BEK-F50/50-G2TI-IBS
				18 to 35							Blue	BEK-F50/50-G3TI-IBS
				18 to 35							White	BEK-F50/50-G5TI-IBS
	100 x 100	–	130 x 160 x 15	15 to 35	0 to +50	■	■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-F100/100-G0TI-IBS
				15 to 35							Red	BEK-F100/100-G1TI-IBS
				18 to 35							Green	BEK-F100/100-G2TI-IBS
				18 to 35							Blue	BEK-F100/100-G3TI-IBS
				18 to 35							White	BEK-F100/100-G5TI-IBS
	150 x 150	–	180 x 210 x 15	15 to 35	0 to +50	■	■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-F150/150-G0TI-IBS
				15 to 35							Red	BEK-F150/150-G1TI-IBS
				18 to 35							Green	BEK-F150/150-G2TI-IBS
				18 to 35							Blue	BEK-F150/150-G3TI-IBS
				18 to 35							White	BEK-F150/150-G5TI-IBS
	200 x 200	–	230 x 260 x 18	15 to 35	0 to +50	■	■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-F200/200-G0TI-IBS
				15 to 35							Red	BEK-F200/200-G1TI-IBS
				18 to 35							Green	BEK-F200/200-G2TI-IBS
				18 to 35							Blue	BEK-F200/200-G3TI-IBS
				18 to 35							White	BEK-F200/200-G5TI-IBS
	250 x 250	–	317 x 317 x 23	24	0 to +40				IP 67	Aluminum Black Anodized	Red	BEK-FL250/250-G1T-IBS
											White	BEK-FL250/250-G5T-IBS
	250 x 250	–	317 x 317 x 23	24	0 to +40				IP 20	Aluminum Black Anodized	White	BEK-FL250/250-R50-G5T-IBS

	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Light intensity can be adjusted	Trigger	Protection class	Housing material	Light color	Product description
BE-F Area lights with switchable constant light												
	400 x 400	–	467 x 467 x 23	24	0 to +40				IP 67	Aluminum Black Anodized	■ Red	BEK-FL400/400-G1T-IBS
											□ White	BEK-FL400/400-G5T-IBS
	400 x 400	–	467 x 467 x 23	24	0 to +40				IP 20	Aluminum Black Anodized	□ White	BEK-FL400/400-R50-G5T-IBS
	1,000 x 1,000	–	1067 x 1067 x 23	24	0 to +40				IP 67	Aluminum Black Anodized	■ Red	BEK-FL1000/1000-G1T-IBS
											□ White	BEK-FL1000/1000-G5T-IBS

Externally flashable area lights are suited for operation using a constant current source or a flash controller. They are the ideal solution for very short camera exposure times and therefore for extremely high-speed processes.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	Operation exclusively with flash controller
Risk group	Clear (DIN EN 62471)
Protection class	III, operation on protective low voltage
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Ambient temperature	0 to +50 °C
Insulation proof voltage	500 V
Housing material	Aluminum, black anodized
Connection	Cable PUR 2.5 m

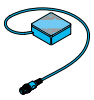
	Illuminated area/length (mm)	Dispersion angle (°)	Size / housing design (mm)	Ambient temperature (C°)	Pulse power consumption (W)	Pulse overload factor	Pulse current-carrying capacity (mA)	Protection class	Window material	Window	Light color	Product description
BE-F Area lights externally flashable												
	50 x 50	–	80 x 80 x 13	0 to 50	Max. 135	Max. 18	Max. 6,400	IP 67	PC, opal	Diffuse	IR Infrared	BE-F50/50-F0-K
					Max. 25	Max. 6.4	Max. 1,600				■ Red	BE-F50/50-F1-K
					Max. 40	Max. 8	Max. 1,600				□ White	BE-F50/50-F5-K
	100 x 100	–	130 x 130 x 13	0 to 50	Max. 275	Max. 18	Max. 12,800	IP 67	PC, opal	Diffuse	IR Infrared	BE-F100/100-F0-K
					Max. 48	Max. 6.4	Max. 3,200				■ Red	BE-F100/100-F1-K
					Max. 80	Max. 9	Max. 3,200				□ White	BE-F100/100-F5-K
	150 x 150	–	180 x 180 x 13	0 to 50	Max. 460	Max. 19	Max. 19,200	IP 67	PC, opal	Diffuse	IR Infrared	BE-F150/150-F0-K
					Max. 80	Max. 6.6	Max. 4,800				■ Red	BE-F150/150-F1-K
					Max. 125	Max. 9.6	Max. 4,800				□ White	BE-F150/150-F5-K
	200 x 200	–	230 x 230 x 13	0 to 50	Max. 500	Max. 18	Max. 19,900	IP 67	PC, opal	Diffuse	IR Infrared	BE-F200/200-F0-K
					Max. 120	Max. 9	Max. 6,400				■ Red	BE-F200/200-F1-K
					Max. 180	Max. 9	Max. 6,400				□ White	BE-F200/200-F5-K

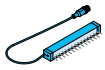
BE-B BARLIGHTS

Barlights with switchable constant light are suited for operation using a 24 V DC voltage source. They offer a constant light intensity across a wide voltage range.

Technical data (typ.)	+20 °C, 24 V DC
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Plug connector	M12
Connection cable	VK… (optionally available)

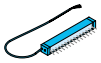
CE

	Illuminated area / length (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Trigger	Protection class	Housing material	Light color	Product description
BE-B Barlights with switchable constant light											
	30 x 30	–	30 x 30 x 20	24	0 to +40			IP 67	Aluminum Black Anodized	Red	BE-A30/30-G1-K-BS
										White	BE-A30/30-G5-K-BS
	50 x 50	–	50 x 50 x 20	24	0 to +40			IP 67	Aluminum Black Anodized	Red	BE-A50/50-G1-K-BS
										White	BE-A50/50-G5-K-BS
 SMD-LED	16 x 65	120°	16 x 20 x 84	24	0 to +40			IP 20	Aluminum Black Anodized	Infrared	BE 1-A65/120-G0-K-BS
										Red	BE 1-A65/120-G1-K-BS
										Green	BE 1-A65/120-G2-K-BS
										Blue	BE 1-A65/120-G3-K-BS
										White	BE 1-A65/120-G5-K-BS
	16 x 130	120°	16 x 20 x 144	24	0 to +40			IP 20	Aluminum Black Anodized	Infrared	BE 1-A130/120-G0-K-BS
										Red	BE 1-A130/120-G1-K-BS
										Green	BE 1-A130/120-G2-K-BS
										Blue	BE 1-A130/120-G3-K-BS
										White	BE 1-A130/120-G5-K-BS
	16 x 240	120°	16 x 20 x 254	24	0 to +40			IP 20	Aluminum Black Anodized	Infrared	BE 1-A240/120-G0-K-BS
										Red	BE 1-A240/120-G1-K-BS
										Green	BE 1-A240/120-G2-K-BS
										Blue	BE 1-A240/120-G3-K-BS
										White	BE 1-A240/120-G5-K-BS

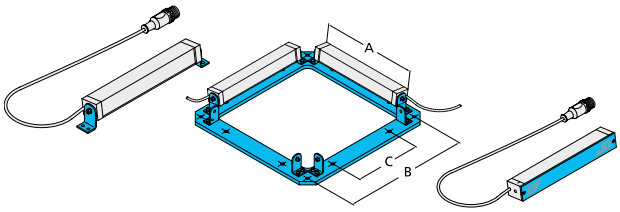
	Illuminated area / length (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Trigger	Protection class	Housing material	Light color	Product description
BE-B Barlights with switchable constant light											
	16 x 130	–	16 x 20 x 144	24	0 to +40			IP 20	Aluminum Black Anodized	IR Infrared	BE 1-A130-G0-K-BS
										Red	BE 1-A130-G1-K-BS
										Green	BE 1-A130-G2-K-BS
										Blue	BE 1-A130-G3-K-BS
										White	BE 1-A130-G5-K-BS
	16 x 240	–	16 x 20 x 254	24	0 to +40			IP 20	Aluminum Black Anodized	IR Infrared	BE 1-A240-G0-K-BS
										Red	BE 1-A240-G1-K-BS
										Green	BE 1-A240-G2-K-BS
										Blue	BE 1-A240-G3-K-BS
										White	BE 1-A240-G5-K-BS
	96 x 23	30°	40 x 60 x 113	18 to 30	0 to +40	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK-A100-G0T-K-BS
										Red	BEK-A100-G1T-K-BS
										Green	BEK-A100-G2T-K-BS
										Blue	BEK-A100-G3T-K-BS
										White	BEK-A100-G5T-K-BS
	196 x 23	30°	40 x 60 x 213	18 to 30	0 to +40	■	■	IP 67	Aluminum Black Anodized	Red	BEK-A200-G1T-K-BS
	296 x 23	30°	40 x 60 x 313	18 to 30	0 to +40	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK-A300-G0T-K-BS
										Red	BEK-A300-G1T-K-BS
										Green	BEK-A300-G2T-K-BS
										Blue	BEK-A300-G3T-K-BS
										White	BEK-A300-G5T-K-BS
	396 x 23	30°	40 x 60 x 413	18 to 30	0 to +40	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK-A400-G0T-K-BS
										Red	BEK-A400-G1T-K-BS
										White	BEK-A400-G5T-K-BS
	496 x 23	30°	40 x 60 x 513	18 to 30	0 to +40	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK-A500-G0T-K-BS
										Red	BEK-A500-G1T-K-BS
										White	BEK-A500-G5T-K-BS

Externally flashable barlights are suited for operation using a constant current source or a flash controller. They are the ideal solution for very short camera exposure times and therefore for extremely high-speed processes.

Technical data (typ.)	+20 °C, 24 V DC
Service voltage	Operation exclusively with flash controller
Risk group	Clear (DIN EN 62471)
Protection class	III, operation on protective low voltage
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Ambient temperature	0 to +50 °C
Insulation proof voltage	500 V
Housing material	Aluminum, black anodized
Connection	Cable PUR 2.5 m

	Illuminated area/length (mm)	Dispersion angle (°)	Size / housing design (mm)	Ambient temperature (C°)	Pulse power consumption (W)	Pulse overload factor	Pulse current-carrying capacity (mA)	Protection class	Window material	Window	Light color	Product description
BE-B Barlights externally flashable												
	16 x 130	–	16 x 20 x 144	0 to 40	31	8	1,350	IP 20			Red	BE-A130-F1-K
					35	10	1,400				White	BE-A130-F5-K

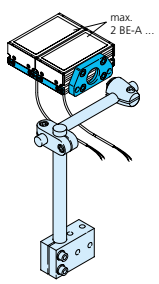
Accessories for BE-A 130…

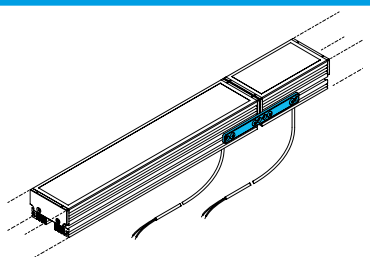


see “Lighting accessories”, page 230

BE-B Barlights externally flashable												
	46 x 95	–	60 x 40 x 113	0 to 40	290	9.33	20,000	IP 67	PMMA	Clear	IR Infrared	BE-A100-F0-K
					240	8.0	8,000				Red	BE-A100-F1-K
					250	8.0	8,000				White	BE-A100-F5-K
	46 x 295	–	60 x 40 x 313	0 to 40	1,500	24	60,000	IP 67	PMMA	Clear	IR Infrared	BE-A300-F0-K
					720	12	24,000				Red	BE-A300-F1-K
					750	12	24,000				White	BE-A300-F5-K

Accessories for BE-A 100… / BE-A 300…





see “Lighting accessories”, page 230

BE-P SPOTLIGHTS

Spotlights with switchable constant light are suited for operation using a 24 V DC voltage source. They offer a constant light intensity over a wide voltage range and are distinguished by features such as trigger inversion and brightness adjustment.

Technical data (typ.)	**+20 °C, 24 V DC**
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Plug connector	M12
Connection cable	VK… (optionally available)

CE

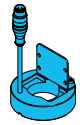
	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Trigger	Protection class	Housing material	Light color	Product description
BE-P Spotlights with switchable constant light											
		25°	M12 x 71	10 to 30	0 to +40	■	■	IP 67	Brass nickel plated	Red	BEK-PM12-G1T-BS
										White	BEK-PM12-G5T-BS
	Ø21	7°	30 x 32 x 60	18 to 30	0 to +40	■	■	IP 67	Aluminum black anodized	Infrared	BEK-P7-G0T-IBS
										Red	BEK-P7-G1T-IBS
										Blue	BEK-P7-G3T-IBS
										White	BEK-P7-G7T-IBS
	Ø21	10°	30 x 32 x 60	18 to 30	0 to +40	■	■	IP 67	Aluminum black anodized	UV light	BEK 1-P14-G7TI-IBS
	Ø21	14°	30 x 32 x 60	18 to 30	0 to +40	■	■	IP 67	Aluminum black anodized	Infrared	BEK-P14-G0TI-IBS
										Red	BEK-P14-G1TI-IBS
										Blue	BEK-P14-G3TI-IBS
										White	BEK-P14-G5TI-IBS
										UV light	BEK-P14-G7TI-IBS
	Ø21	25°	30 x 32 x 60	18 to 30	0 to +40	■	■	IP 67	Aluminum black anodized	UV light	BEK-P25-G7TI-IBS
	Ø21	30°	30 x 32 x 60	18 to 30	0 to +40	■	■	IP 67	Aluminum black anodized	Infrared	BEK-P30-G0TI-IBS
										Red	BEK-P30-G1TI-IBS
										Blue	BEK-P30-G3TI-IBS
										White	BEK-P30-G5TI-IBS

BE-R RINGLIGHTS

Ringlights with switchable CW light are suited for operation using a 24 V DC voltage source. They offer a constant light intensity over a wide voltage range and are distinguished by features such as trigger inversion and brightness adjustment.

Technical data (typ.)	+20 °C, 24 V DC
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Plug connector	M12
Connection cable	VK… (optionally available)

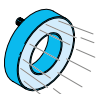
CE

	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Light intensity can be adjusted	Trigger	Protection class	Housing material	Light color	Product description
BE-R Ringlights with switchable CW light												
	Ø 30	90°	Ø69x20	24	0 to +40				IP 67	Aluminum Black Anodized	Infrared	BE-R30-G0-K-BS-CLR [1]
											Infrared	BE-R30-G0-K-BS-DIF [2]
	Ø 30	80°	Ø69x20	24	0 to +40				IP 67	Aluminum Black Anodized	Red	BE-R30-G1-K-BS-CLR [1]
											Red	BE-R30-G1-K-BS-DIF [2]
											Red	BE-R30-G1-K-BS-POL [3]
	Ø 30	80°	Ø69x20	24	0 to +40				IP 67	Aluminum Black Anodized	White	BE-R30-G5-K-BS-CLR [1]
											White	BE-R30-G5-K-BS-DIF [2]
											White	BE-R30-G5-K-BS-POL [3]
	Ø 70	30°	Ø130x29	18 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-R70/30-G0TI-IBS-CLR [1]
											Infrared	BEK-R70/30-G0TI-IBS-DIF [2]
	Ø 70	30°	Ø130x29	18 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	Red	BEK-R70/30-G1TI-IBS-CLR [1]
											Red	BEK-R70/30-G1TI-IBS-DIF [2]
											Red	BEK-R70/30-G1TI-IBS-POL [3]
	Ø 70	20°	Ø130x29	18 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	Green	BEK-R70/20-G2TI-IBS-CLR [1]
											Green	BEK-R70/20-G2TI-IBS-DIF [2]
											Green	BEK-R70/20-G2TI-IBS-POL [3]
	Ø 70	20°	Ø130x29	18 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	Blue	BEK-R70/20-G3TI-IBS-CLR [1]
											Blue	BEK-R70/20-G3TI-IBS-DIF [2]
											Blue	BEK-R70/20-G3TI-IBS-POL [3]
	Ø 70	120°	Ø130x29	18 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	White	BEK-R70/120-G5TI-IBS-CLR [1]
											White	BEK-R70/120-G5TI-IBS-DIF [2]
											White	BEK-R70/120-G5TI-IBS-POL [3]
		90°		22.8 to 25.2	0 to +40		■	■	IP 67	Aluminum Black Anodized	Infrared	BEK-R33-E0T-K-BS [4]
											Red	BEK-R33-E1T-K-BS [4]
											White	BEK-R33-E5T-K-BS [4]

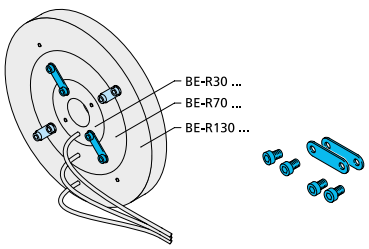
[1] Clear protection window
[2] Diffusor panel
[3] Polarizer panel
[4] Accessories for CS 50 Page 213

Externally flashable ringlights are suited for operation using a constant current source or a flash controller. They are the ideal solution for very short camera exposure times and therefore for extremely high-speed processes.

Technical data (typ.)	**+20 °C, 24 VDC**
Service voltage	Operation exclusively with flash controller
Risk group	Clear (DIN EN 62471)
Protection class	III, operation on protective low voltage
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Ambient temperature	0 to +50 °C
Insulation proof voltage	500 V
Housing material	Aluminum, black anodized
Connection	Cable PUR 2.5 m

	Illuminated area/length (mm)	*Dispersion angle (°)*	*Size / housing design (mm)*	*Ambient temperature (C°)*	*Pulse power consumption (W)*	*Pulse overload factor*	*Pulse current-carrying capacity (mA)*	*Protection class*	*Window material*	*Window*	*Light color*	*Product description*
BE-R Ringlights externally flashable												
	Ø 30	30 °	Ø 69 x 20	0 to 40	Max. 30	8	Max. 2,000	IP 67	PMMA	Clear	■ Red	BE-R30-F1-K-CLR
										Diffuse	■ Red	BE-R30-F1-K-DIF
										Polarized	■ Red	BE-R30-F1-K-POL
	Ø 30	120 °	Ø 69 x 20	0 to 40	Max. 45	10	Max. 2,000	IP 67	PMMA	Clear	□ White	BE-R30-F5-K-CLR
										Diffuse	□ White	BE-R30-F5-K-DIF
										Polarized	□ White	BE-R30-F5-K-POL
	Ø 70	30 °	Ø 130 x 20	0 to 40	Max. 96	8	Max. 6,000	IP 67	PMMA	Clear	■ Red	BE-R70-F1-K-CLR
										Diffuse	■ Red	BE-R70-F1-K-DIF
										Polarized	■ Red	BE-R70-F1-K-POL
	Ø 70	120 °	Ø 130 x 20	0 to 40	Max. 140	10	Max. 6,000	IP 67	PMMA	Clear	□ White	BE-R70-F5-K-CLR
										Diffuse	□ White	BE-R70-F5-K-DIF
										Polarized	□ White	BE-R70-F5-K-POL
	Ø 130	30 °	Ø 200 x 20	0 to 40	Max. 230	8	Max. 12,000	IP 67	PMMA	Clear	■ Red	BE-R130-F1-K-CLR
										Diffuse	■ Red	BE-R130-F1-K-DIF
										Polarized	■ Red	BE-R130-F1-K-POL
	Ø 130	120 °	Ø 200 x 20	0 to 40	Max. 275	10	Max. 11,000	IP 67	PMMA	Clear	□ White	BE-R130-F5-K-CLR
										Diffuse	□ White	BE-R130-F5-K-DIF
										Polarized	□ White	BE-R130-F5-K-POL

Accessories for ringlights



see “Lighting accessories”, page 230

BE-K COAXIAL LIGHTS

Coaxial lights are used for shadow-free, axial illumination of the object examined. Surface reflections are reliably suppressed. They are available in all application-relevant color temperatures and are distinguished by features such as trigger inversion and brightness adjustment.
Coaxial lights are suited for operation using a 24 VDC voltage source and are brightness-stabilized for a wide voltage range.

CE

Technical data (typ.)	**+20 °C, 24 V DC**
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Shock/vibration load	30 g / 10 – 55 Hz, 1 mm
Plug connector	M12
Connection cable	VK… (optionally available)

	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Light intensity can be adjusted	Trigger	Protection class	Housing material	Light color	Product description
BE-K Coaxial lights												
	50 x 50	–	62 x 58 x 103.5	18 to 35	0 to +40	■	■	■	IP 20	Aluminum Black Anodized	Red	BEK-K50/50-G1TI-IBS
											Green	BEK-K50/50-G2TI-IBS
											Blue	BEK-K50/50-G3TI-IBS
											White	BEK-K50/50-G5TI-IBS

BE-D DARK FIELD LIGHTS

Dark field lights are used for the contrast enhancement of surface defects, for example for quality control. In these lighting systems, light is injected transversely to the camera's viewing direction. They are available in all application-relevant color temperatures and are distinguished by features such as trigger inversion and brightness adjustment.

Technical data (typ.)	**+20 °C, 24 V DC**
Trigger input low level	0 to < 2.8 V
Trigger input high level	> 3.3 to 35 V
Shock/vibration load	30 g / 10–55 Hz, 1 mm
Plug connector	M12
Connection cable	VK… (optionally available)

CE

	Illuminated area (mm)	Dispersion angle (°)	Size / housing design (mm)	Service voltage (VDC)	Ambient temperature (°C)	Integrated control of power output	Light intensity can be adjusted	Trigger	Protection class	Housing material	Light color	Product description
BE-D Dark field lights												
	Ø 70	–	95 x 130 x 12	10 to 35	0 to +40	■	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK-D70-G0TI-K-BS
											Red	BEK-D70-G1TI-K-BS
											Green	BEK-D70-G2TI-K-BS
											Blue	BEK-D70-G3TI-K-BS
											White	BEK-D70-G5TI-K-BS
	Ø 120	–	170 x 200 x 15	10 to 35	0 to +50	■	■	■	IP 67	Aluminum Black Anodized	IR Infrared	BEK 1-D120-G0TI-IBS
											Red	BEK 1-D120-G1TI-IBS
											Green	BEK 1-D120-G2TI-IBS
											Blue	BEK 1-D120-G3TI-IBS
											White	BEK 1-D120-G5TI-IBS

CUSTOMIZED LIGHTING

Does your application have limited installation space available?

Do you require special lighting for image processing?

Are the standard devices from our product line unable to meet the special requirements of your application needs?

Our special customer-specific lights give you a cost-effective option for meeting the particular needs of your application.

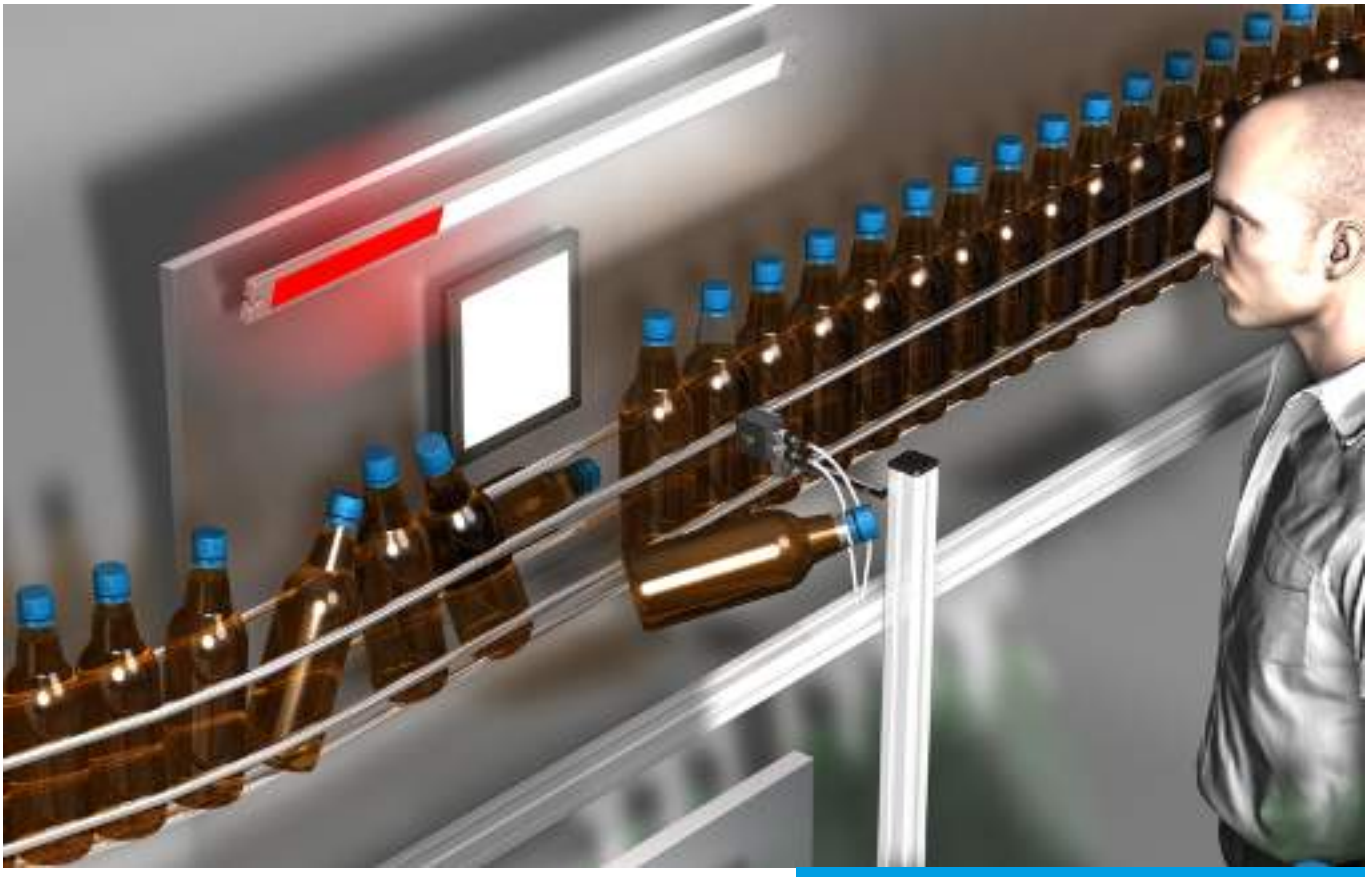
With our custom lights, you can achieve maximum process reliability for your specific image processing application.

And all this at the usual highest di-soric level of quality.

We will review special requirements related to size and design, light color and connectivity together with you and, upon request, we will implement small production runs of customized products.

Challenge us. We work together with you.

Machine lighting



The robust, industrial-suited lights make the illumination of machines possible in the highest light quality and are distinguished by their compact design and load-free triggers that meet the strictest requirements. A large selection of overall lengths are available for individual machines.

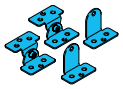
MB-N

The MB-N machine lights have a compact design and feature load-free triggers. They offer the highest light quality in white, which meets the strictest requirements.

Technical data (typ.)	+20 °C
Service voltage	24 VDC (Supply Class 2)
Light color	5,000 K white (LED)
Ambient temperature	-20 to 40 °C
Protection class	IP 67
Housing material	Aluminum, natural anodized
Connection cable	VK… (optionally available)

DIN EN 12464-1 · c UL us LISTED · CE

	Illuminated area (mm)	No-load current at 24 V	Power draw at 24 V	Light intensity at 0.5 m	Light intensity at 1.0 m	Luminous flux	Cable 300 mm, M12, 3-pin	Cable 3,000 mm, flying leads	Weight (excluding packaging)	Product description
MB-N										
	95 x 30	190 mA	4.6 W	720 lx	220 lx	440 lm	■		115 g	MB-N-126-K-B3
								■	175 g	MB-N-126-K
	220 x 30	450 mA	10.8 W	1800 lx	530 lx	1100 lm	■		210 g	MB-N-251-K-B3
								■	260 g	MB-N-251-K
	440 x 30	900 mA	21.6 W	3200 lx	1000 lx	2200 lm	■		390 g	MB-N-481-K-B3
								■	440 g	MB-N-481-K
	660 x 30	1350 mA	32.4 W	3900 lx	1300 lx	3300 lm	■		550 g	MB-N-701-K-B3
								■	600 g	MB-N-701-K
	870 x 30	1800 mA	43.2 W	4400 lx	1600 lx	4400 lm	■		700 g	MB-N-911-K-B3
								■	750 g	MB-N-911-K



Machine lighting accessories

see “Accessories for machine and signal lighting”, page 234

MB-NP PROTECTED

Compact MB-NP Protected machine lighting impresses with a high degree of robustness in the face of rough ambient conditions. This machine lighting from di-soric withstand a large number of chemically aggressive cutting and drilling fluids and are protected against cuttings. As a feature, they have load-free triggers and offer the highest light quality in white, which meets the strictest requirements.

Technical data (typ.)	+20 °C
Service voltage	24 VDC (Supply Class 2)
Light color	5,000 K white (LED)
Ambient temperature	0 to 40 °C
Protection class	IP 67
Housing material	Aluminum, natural anodized

DIN EN 12464-1 · cULus LISTED · CE

	Illuminated area (mm)	No-load current at 24 V	Power draw at 24 V	Light intensity at 0.5 m	Light intensity at 1.0 m			Cable 3,000 mm, flying leads	Weight (excluding packaging)	Product description
MB-NP Protected for use in corrosive environments										
	30 x 220	450 mA	10.8 W	1,400 lx	430 lx			■	410 g	MB-NP-250-K
	30 x 440	900 mA	21.6 W	2,600 lx	800 lx			■	700 g	MB-NP-480-K

Machine lighting accessories

see “Accessories for machine and signal lighting”, page 234

MB-RGBW WITH STATUS INDICATOR

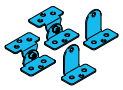
This machine lighting from di-soric offers the highest light quality in white and RGB which meets the strictest requirements. Individualized color parameterization is possible by means of IO-Link. Compact construction and load-free triggers are further features of this lighting.

Technical data (typ.)	**+20 °C**
Service voltage	24 VDC (Supply Class 2)
Operation modes	RGB: constant, blinking, flashing (MB-RGBW…)
Service voltage	24 VDC (Supply Class 2)
Light color	RGB + user-defined
Ambient temperature	0 to 40 °C
Protection class	IP 67
Housing material	Aluminum, natural anodized
Connection cable	VK …/5 (optionally available)

IO-Link

MB-RGBW with status indicator

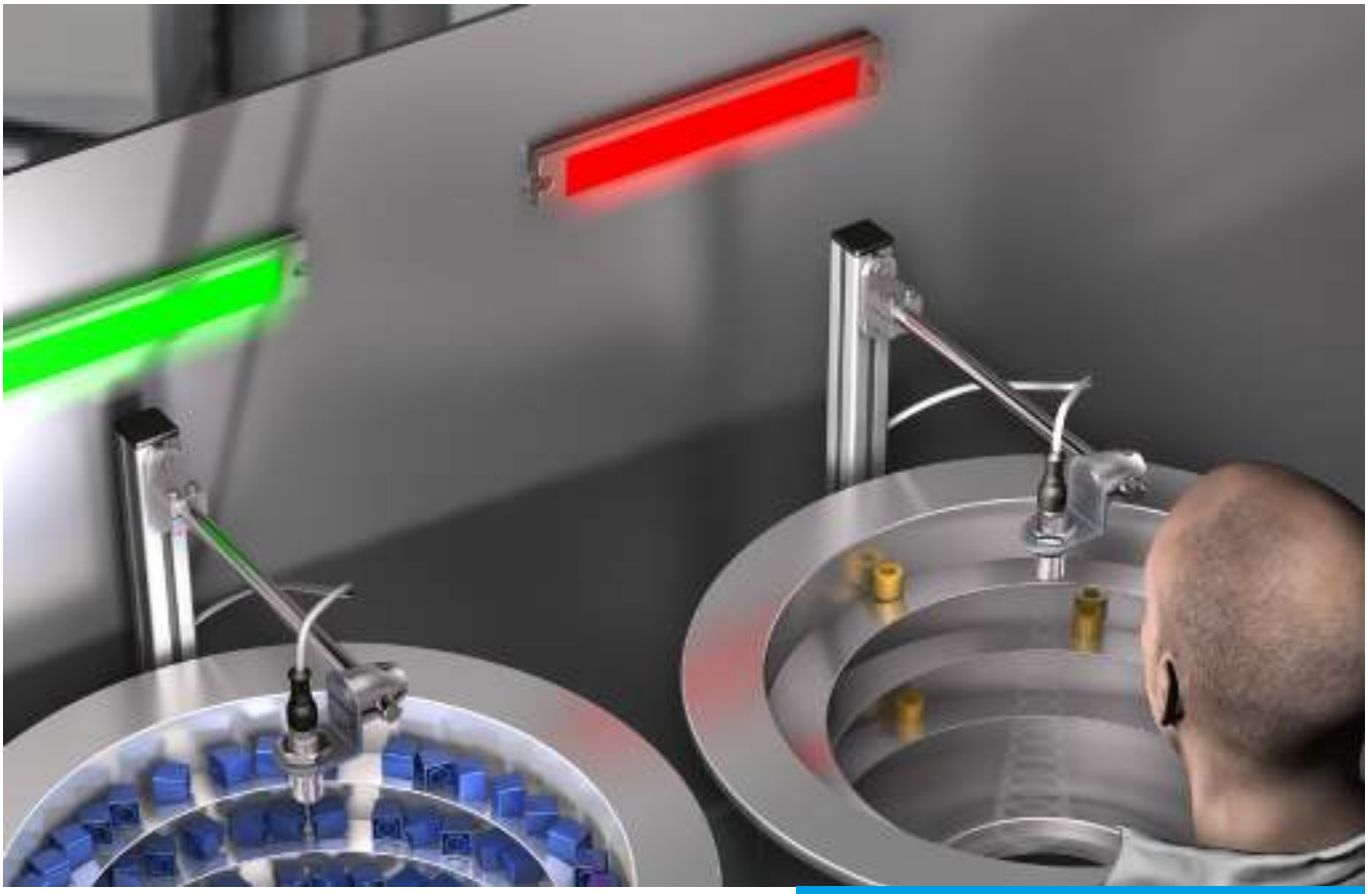
	Illuminated area (mm)	No-load current at 24 V	Power draw at 24 V	IO-Link	Luminous flux			Cable 300 mm, M12, 3-pin	Weight (excluding packaging)	Product description
	220 x 30	305 mA	7.3 W	■	440 lm			■	210 g	MB-RGBW-251-K-B5
	440 x 30	650 mA	15.6 W	■	1,100 lm			■	390 g	MB-RGBW-481-K-B5
	660 x 30	1,100 mA	26.4 W	■	2,200 lm			■	550 g	MB-RGBW-701-K-B5
	870 x 30	1,520 mA	36.5 W	■	3,300 lm			■	700 g	MB-RGBW-911-K-B5



Machine lighting accessories

see “Accessories for machine and signal lighting”, page 234

Signal lighting



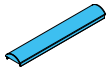
Signal lighting from di-soric visibly indicate the status of machines. Ready-to-run through 3 color presets (red-yellow-green) or freely parameterizable by way of IO-Link.

SB-RGB

SB-RGB signal lighting with IO-Link are intelligent units that can be adapted to custom requirements. They feature a large RGB illuminated area and display the machine status so that it is visible from far away. They can be configured by means of IO-Link – light functions such as color, brightness and the flashing of individual colors can be freely adjusted. Even without IO-Link configuration, the SB-RGB can be used immediately out-of-the-box thanks to 3 triggerable color presets.

Technical data (typ.)	+20 °C
Service voltage	24 VDC (Supply Class 2)
Light color	RGB + user-defined
Ambient temperature	0 to 40 °C
Protection class	IP 67
Operation modes	Flashing (SB-RGB…)
Housing material	Aluminum, natural anodized / PU, glass clear
Plug connector	Cable: 300 mm with M12 connector, 5-pin
Connection cable	VK …/5 (optionally available)

	Illuminated area (mm)	No-load current at 24 V DC	Power draw at 24 V	IO-Link	Weight (excluding packaging)	Product description
SB-RGB						
	95 x 30	115 mA RMS/150 mA Peak	2.8 W	■	115 g	SB-RGB-126-K-B5
	220 x 30	195 mA RMS/390 mA Peak	4.7 W	■	210 g	SB-RGB-251-K-B5
	440 x 30	385 mA RMS/750 mA Peak	9.2 W	■	390 g	SB-RGB-481-K-B5
	660 x 30	565 mA RMS/1,100 mA Peak	13.5 W	■	550 g	SB-RGB-701-K-B5
	870 x 30	745 mA RMS/1.400 mA Peak	17.8 W	■	700 g	SB-RGB-911-K-B5



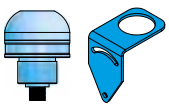
Accessories for SB-RGB installation

see “Accessories for machine and signal lighting”, page 234

SBP-RGB

High-efficiency and multi-functional: the dome-shaped signal lighting from di-soric offers 360° visibility, a nearly endless number of colors, individual brightness and flashing behaviors - all functions can be configured through IO-Link. The compact design and high degree of protection (IP67) enable use in harsh ambient conditions.

Technical data (typ.)	+20 °C
Service voltage	24 VDC ± 5% (supply class 2)
Light color	RGB + user-defined
Ambient temperature	0 to 40 °C
Protection class	IP 67
Operation modes	Constant, blinking and flashing
Housing material	Aluminum, natural anodized / PC, diffuse
Connection	M12, 5-pin

	Illuminated area (mm)	Intrinsic current consumption at 24 V DC	Power draw at 24 V	IO-Link	Weight (excluding packaging)	Maximum overall length of all power supply lines with 5 x 0.34 mm² (AWG 22) / min. 24 V DC	Mounting angle	Product description
SBP-RGB								
	Ø 50x20	65 mA	1.58 W	■	102 g	50 m	■	SBP-RGB-R50D-B5

Sensor accessories

di-soric offers an extensive selection of accessories for its sensors, perfectly matched to the various products.

CONNECTION TECHNOLOGY

In the area of connection technology, a wide variety of electrical contacts for custom industrial-suited assembly are available.

Technical data (typ.)	+20 °C, 24 V DC
Protection class	IP 67

CE

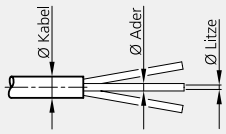
	Size	Number of wires	Cable length (m)	Metal coupling ring	Max. permissible service voltage (V AC/DC)	Connector material	Cable material PVC, PU coating	Cable material PUR	Product description	Connector material	Cable material PVC	Product description
Connection cable M8												
 straight	M8	3	2.5	■	60	PU		■	TKHM-Z-2.5 [2]	PVC	■	TKPM-Z-2.5
			5.0						TKHM-Z-5 [2]			TKPM-Z-5
		4	2.5						TKHM-Z-2.5/4 [2]			TKPM-Z-2.5/4
			5.0						TKHM-Z-5/4 [2]			TKPM-Z-5/4
 angled	M8	3	2.5	■	60	PU	■		TKHM-W-2.5 [2]	PVC	■	TKPM-W-2.5
			5.0						TKHM-W-5 [2]			TKPM-W-5
		4	2.5						TKHM-W-2.5/4 [2]			TKPM-W-2.5/4
			5.0						TKHM-W-5/4 [2]			TKPM-W-5/4
Connection cable M12												
 straight	M12	4	2.5	■	250	PUR		■	VKHM-Z-2.5/4 [2]	PVC	■	VKPM-Z-2.5/4
			5.0						VKHM-Z-5/4 [2]			VKPM-Z-5/4
			10.0						VKHM-Z-10/4 [2]			VKPM-Z-10/4
 straight	M12	5	5.0	■	125	PUR		■	VKHM-Z-5/5 [2]			
			10.0						VKHM-Z-10/5 [2]			
 angled	M12	4	2.5	■	250	PUR		■	VKHM-W-2.5/4 [2]	PVC	■	VKPM-W-2.5/4
			5.0						VKHM-W-5/4 [2]			VKPM-W-5/4
			10.0						VKHM-W-10/4 [2]			VKPM-W-10/4
 angled	M12	5	5.0	■	125	PUR		■	VKHM-W-5/5 [2]			
			10.0						VKHM-W-10/5 [2]			
 straight	M12	8	2.5	■	30	PUR		■	VKHM-Z-2.5/8 [2]			
			5.0						VKHM-Z-5/8 [2]			
 angled	M12	8	2.5	■	30	PUR		■	VKHM-W-2.5/8			
			5.0						VKHM-W-5/8 [2]			
 straight	M12	12	5.0	■	30	PUR		■	VKSM-Z-5/12-A [1,2]			
			10.0						VKSM-Z-10/12-A [1,2]			
 straight	M12	12	5.0	■	30	PVC		■	VKHM-Z-5/12-A [1]			

[1] Shielded cable

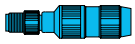
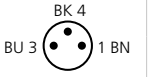
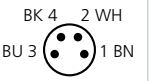
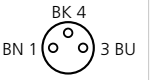
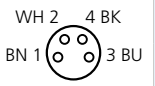
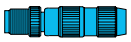
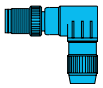
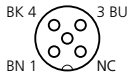
[2] Drag chain compatible

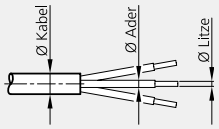
FIELD-ATTACHABLE PLUG CONNECTORS

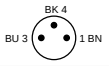
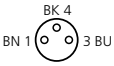
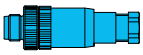
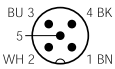
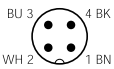
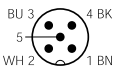
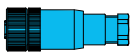
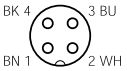
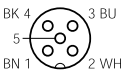
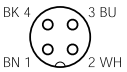
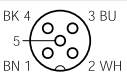
Field-attachable plug connectors have a high protection class and are available in various designs. They are useful accessory parts for connecting sensors and products for safety technology to existing and mechanically-incompatible connecting cables.



Wire must not be stripped!

	Connection diagram (view of the connection side)	Connector / number of pins	Coupling / number of pins	Max. voltage range (V)	Ambient temperature (°C)	Clamping area Ø Cable (mm)	Clamping area Ø Wire (mm)	Cross-section of litz wires (mm²)	Product description
Connector M8									
		M8-3		32	-25 to +85	2.5 to 5.1 4.0 to 5.1	1.2 to 1.6	0.14 to 0.34 0.25 to 0.5	MS-Z-8/0.14 MS-Z-8
		M8-4		32	-25 to +85	2.5 to 5.1 4.0 to 5.1	1.2 to 1.6	0.14 to 0.34 0.25 to 0.5	MS-Z-8/4/0.14 MS-Z-8/4
			M8-3	32	-25 to +85	2.5 to 5.1 4.0 to 5.1	1.2 to 1.6	0.14 to 0.34 0.25 to 0.5	MK-Z-8/0.14 MK-Z-8
			M8-4	32	-25 to +85	2.5 to 5.1 4.0 to 5.1	1.2 to 1.6	0.14 to 0.34 0.25 to 0.5	MK-Z-8/4/0.14 MK-Z-8/4
Connector M12									
		M12-4		32	-25 to +85	2.9 to 5.1 4.0 to 5.1	1.2 to 1.6	0.14 to 0.34 0.25 to 0.5	MS-Z-12/4/0.14 MS-Z-12/4
		M12-4		32	-25 to +85	4.0 to 5.1	1.2 to 1.6	0.25 to 0.5	MS-W-12/4
			M12-4	32	-25 to +85	2.9 to 5.1	1.0 to 1.6	0.14 to 0.34	MK-Z-12/4
			M12-4	32	-25 to +85	4.0 to 5.1	1.2 to 1.6	0.25 to 0.5	MK-W-12/4



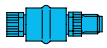
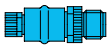
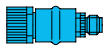
	Connection diagram (view of the connection side)	Connector / number of pins	Coupling / number of pins	terminals	Solder connection	Max. voltage range (V)	Clamping area Ø Cable (mm)	Cross-section of litz wires (mm^2)	Product description
Connector M8									
		M8-3		■		32	3.5 to 5.0	0.25 to 0.34	BS-Z-8/S
		M8-4							BS-Z-8/4/S
		M8-3			■	32	3.5 to 5.0	0.25 to 0.34	BS-W-8
		M8-4							BS-W-8/4
			M8-3	■		32	3.5 to 5.0	0.25 to 0.34	BK-Z-8/S
			M8-4						BK-Z-8/4/S
			M8-3		■	32	3.5 to 5.0	0.25 to 0.34	BK-W-8
			M8-4						BK-W-8/4
Connector M12									
		M12-4		■			4.0 to 6.0	0.75	BS-Z-12
		M12-5		■			4.0 to 6.0	0.75	BS-Z-12/5
		M12-4		■			4.0 to 6.0	0.75	BS-W-12
		M12-5		■			4.0 to 6.0	0.75	BS-W-12/5
			M12-4	■			4.0 to 6.0	0.75	BK-Z-12
			M12-5	■			4.0 to 6.0	0.75	BK-Z-12/5
			M12-4	■			4.0 to 6.0	0.75	BK-W-12
			M12-5	■			4.0 to 6.0	0.75	BK-W-12/5

ADAPTER PLUGS

Adapter plugs have a high protection class and are available in various designs. They are useful accessory parts for connecting sensors to existing and mechanically-incompatible connecting cables.

Technical data (typ.)	+20 °C, 24 V DC
Max. voltage range (V)	24 V
Max. current-carrying capacity (A)	4.0 A

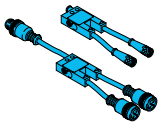
CE

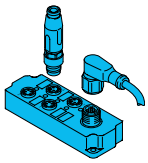
	Coupling / number of pins	Connection diagram	Connector / number of pins						Product description
Adapter plugs									
	M8-3		M8-4						M8K3/M8S4
	M8-4		M8-3						M8K4/M8S3
	M8-3		M12-3						M8K/M12S
	M8-4		M12-4						M8K/M12S/4
	M12-3		M8-3						M12K/M8S
	M12-4		M8-4						M12K/M8S/4

LOGIC DISTRIBUTOR

Matching the sensor range, di-soric offers logic distributors for nearly all function requirements. They can logically link several sensors together and feature a switchable AND/OR switching function. The compact logic distributors, with a high protection class, can be quickly and easily retrofitted and have a large temperature application range.

CE

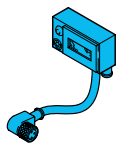
Double logic distributor			
	Connection voltage	10 to 35 V	
	Switching output	pnp, 200 mA, AND / OR	
	Switching frequency	6,000 Hz	
	Protection class	IP 67	
	Type		**Product description**
	Logic distributor M8, AND / OR switchable		AV2-AND/OR-PS-TS
	Logic distributor M12, AND / OR switchable		AV2-AND/OR-PS-IBS

Quadruple logic distributor			
	Connection voltage	10 to 30 V	
	Current-carrying capacity AND/OR	For each 300 mA/logic contact	
	Switching output	pnp 4x, pnp-AND 1x, pnp-OR 1x	
	Protection class	IP 67 (for use of all slots)	
	Type		**Product description**
	AND-M8 dummy plug		BS-Z-8-UND
	5 m connection cable, 8-pin, angled		VKHM-W-5/8
	Logic distributor M8, quadruple		AV4-UND/ODER

COUNTER MODULES

di-soric counter modules count the output signals of a wide variety of sensors and minimize overproduction in part-related orders. The count values are displayed using 6-digit LCD display and remote or are reset at the press of a button. The long-term storage of count values is performed by the use of a buffer battery. The counter modules with robust metal housings are quickly and easily mounted directly to the sensor using plug connectors.

CE

Counting module with reset function			
	Service voltage	10 to 35 V DC	
	Display	LCD display, 6-digit	
	Input	pnp	
	Counting frequency	10,000 Hz	
	Protection class	IP 40	
	Housing material	Aluminum, black anodized	
	Type		**Product description**
	Counter module with reset button, connector / socket M8, 3-pin		ZR 06B-TSSL
	Counter module with reset button and remote reset, connector / socket M12, 4-pin		ZRR 06B-IBS

FUNCTION ADAPTERS

Function adapters can change sensor-specific functions to the desired function (e.g. pulse stretching). They are suitable for all conventional sensors, feature a compact design and can be retrofitted quickly and easily.

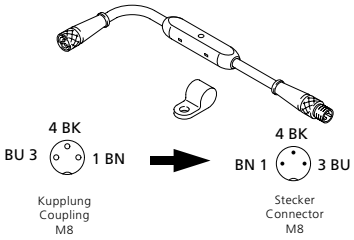
Technical data (typ.)	+20 °C, 24 V DC
Service voltage	10 to 35 V DC
Current-carrying capacity	200 mA, short-circuit proof
No-load current	20 mA
Ambient temperature	-20 to +70 °C
Protection class	IP 67
Protection class	III, operation on protective low voltage

CE

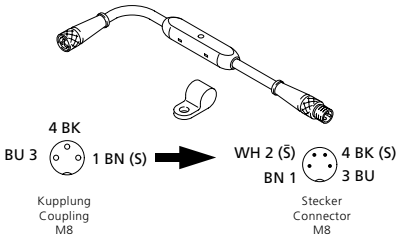
Connection diagram

BN = Brown
BK = Black
BU = Blue
WH = White

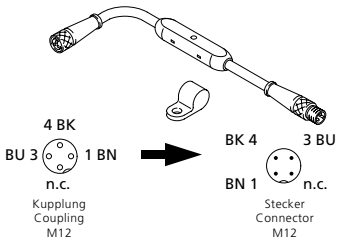
A



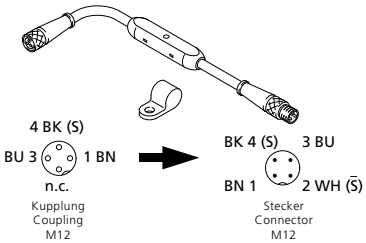
B



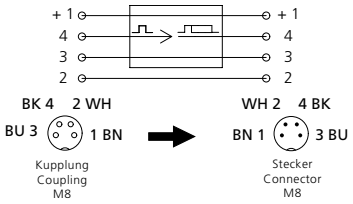
C

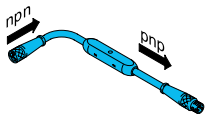
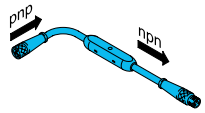
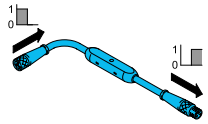
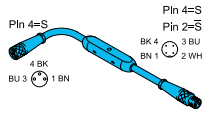
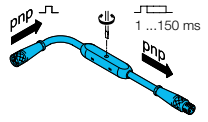


D



E



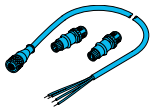
	Minimum pulse length (ms)	Output	Switching frequency (Hz)	Connection diagram (the opposite side)	Coupling	Connector	Product description
pnp threshold switch							
	0.1	pnp	<5,000 Hz	A	M8/3-pin	M8/3-pin	TKHM-Z/TSM-Z/UN
				C	M12/3-pin	M12/3-pin	VKHM-Z/VSM-Z/UN
pnp ⇨ npn converter							
	0.1	npn	<5,000 Hz	A	M8/3-pin	M8/3-pin	TKHM-Z/TSM-Z/U
				C	M12/3-pin	M12/3-pin	VKHM-Z/VSM-Z/U
pnp inverter							
	0.1	pnp	<3,500 Hz	A	M8/3-pin	M8/3-pin	TKHM-Z/TSM-Z/I
				C	M12/3-pin	M12/3-pin	VKHM-Z/VSM-Z/I
pnp antivalence device							
	0.1	pnp	<3,500 Hz	B	M8/3-pin	M8/4-pin	TKHM-Z/TSM-Z/P4
				D	M12/3-pin	M12/4-pin	VKHM-Z/VSM-Z/P4
pnp pulse stretcher							
	0.1	pnp 1 to 150 ms	<500 Hz	A	M8/3-pin	M8/3-pin	TKHM-Z/TSM-Z/T
				E	M8/4-pin	M8/4-pin	TKHM-Z/TSM-Z/T4
				C	M12/3-pin	M12/3-pin	VKHM-Z/VSM-Z/T

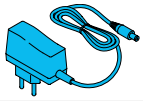
SENSOR TESTERS

The di-soric sensor tester is used to test the proper functioning of all PNP and NPN sensors and light barriers. The output signal of the sensor is expressed by a clear optical and acoustic signal. Practical quick-action sockets and an internal battery power supply ensure fast and flexible use.

CE

Sensor tester for pnp, npn and push-pull sensors			
	Size without protective casing	135 x 76 x 27 mm	
	No-load current	< 40 mA	
	Output voltage	18 V DC	
	Display	LED: green - operation, yellow - switching outputs	
	Protection class	IP 21	
	Housing material	ABS, black plastic	
	Material	Silicone (protective casing)	
	Connection	Color-coded quick-action sockets	
	Current limiting	60 mA in battery operation	
		240 mA in operation with external power supply	
	Power supply	1.5 V batteries type AA (3x)	
		External 12 V DC power supply (optional)	
	Weight	295 g	
			ST 7PNG

Connection set ST-AS For testing of sensors with switching output and M8 or M12 connector		
	-Connection cable with coupling M12, 4-pin	
	-Adapter plug coupling, M8, 3-pin / connector M12, 4-pin (1x)	
	-Adapter plug coupling, M8, 4-pin / connector M12, 4-pin (1x)	
		ST-AS

Power supply for operation at 220 V			
	Output voltage	12 V DC, 2000 mA	
	Connection voltage	100-240 V AC, 50-60 Hz, 800 mA	
			ST-PS-12V

IO-LINK BASICS AND TECHNOLOGY

Getting to the point.

An IO-Link is a point-to-point connection within any network, fieldbus or backplane bus. The IO-Link master can be installed either directly in the field or in the control cabinet.

An IO-Link device can be any sensor, actuator or even a combination of the two.
This device is connected to the IO-Link master by means of a standard connection cable with a maximum length of 20 m.
The IO-Link device communicates with the IO-Link master using a driver file (the IODD – IO-Link Device Description) and can send and receive signals (binary switch signals or analog signals). The IO-Link digitizes these signals directly so that they can be transferred virtually free of interference.

The international IO-Link standard (in accordance with IEC 61131-9) is now regarded as an **“enabler for Industry 4.0”**

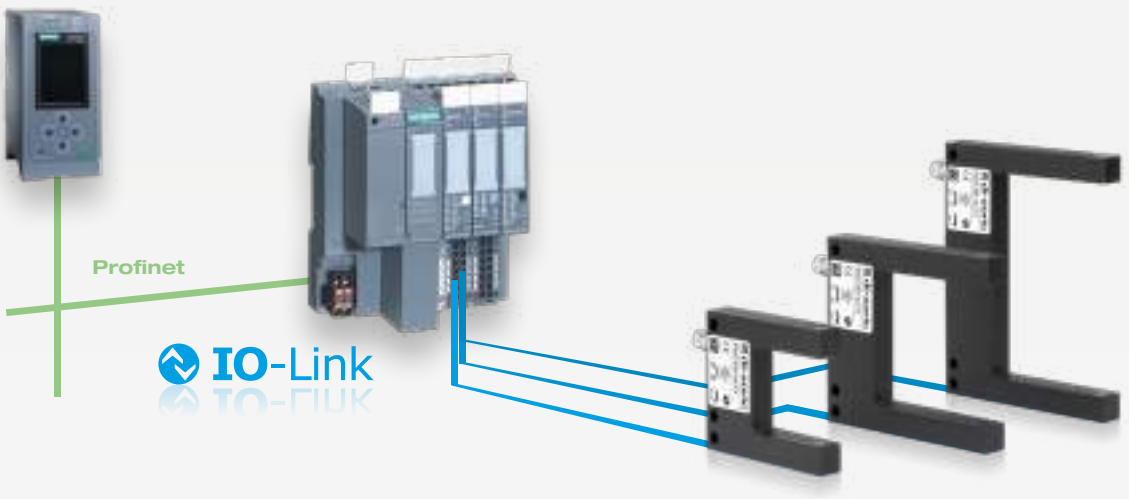
1. Reduced costs
Through reduced storage time

2. Implementation of innovative machine concepts
Thanks to continuous communication

3. Shortening of commissioning times
with cabling using standards

4. Increasing machine productivity
Due to independent parameterization and identification

5. Revolutionizing maintenance
Due to self-diagnosis



This is how IO-Link functions

- Standardized bidirectional point-to-point communication interface for the connection of intelligent sensors and actuators
- Backward compatible for binary PNP or push-pull sensors
- Operation modes without IO-Link (SIO mode) or with IO-Link communication
- 3 standardized data transmission rates 4,800 (COM 1), 38,400 (COM 2), 230,400 Baud (COM 3)
- Unshielded standard sensor cables with a cable length up to 20 m
- Cyclical and acyclical data:
  Process data (e.g. switch signals or distance values) is transmitted cyclically, service data (e.g. parameters) is transmitted acyclically

IOL MASTER

The IO-Link Device V4 tool can be used for operating sensors and actuators with an IO-Link interface (IO-Link devices). The IO-Link devices are described by XML device descriptions and can thus be conveniently monitored and configured in multiple languages. The tool is designed for presetting, testing and demonstrating IO-Link devices. The tool is not intended for ongoing operation in production systems.

We have set up 3 user levels in IODD for you

- OPERATOR
  View only
- MAINTENANCE
  Teach-in and modification of approved settings
- SPECIALIST
  Full access to all available setting options

Only the relevant setting options are provided in the IODD, as opposed to the exhaustive, full listing of all options, which would be confusing.

The IODD was completely developed in accordance with the Smart Sensor Profile, thus making it possible to configure the sensor directly over the SPS without additional parameterization software. The Smart Sensor Profile describes the assignment of the most important indices and sub-indices, thereby enabling devices to be addressed directly by means of the master if the IODD is not available.

Software that does away with lengthy explanations
You know intuitively what each property represents.

Technical data	
USB	USB 2.0 (Mini USB B)
Power supply	5 V / 500 mA (PC USB)
	24 V / 80 mA (IO-Link device from USB)
	24 V / 1 A (IO-Link device from the power supply)
Protected against polarity reversal	Yes
Protection class	III
IO-Link communication	IO-Link specification V1.1
IO-Link port class	A
Temperature range for operation	0 to 45 °C
Storage temperature	-40 to 80 °C
Protection class	IP 20

IO-Link device	
Scope of delivery: IO-Link device tool -USB A-B cable -AC adapter (24V/24W) -"Read Me First" document	IOL master

Accessories	
Connection cable (coupling M12, 4-pin / M12 connector, 4-pin)	VSHM-Z-0.6/VKM-Z/4
Adapter plug (coupling M8, 3-pin / connector M12, 3-pin)	M8K/M12S
Adapter plug (coupling M8, 4-pin / connector M12, 4-pin)	M8K/M12S/4

System requirements for operating the IO-Link device tool V 4.0 software

Computer
Computer with an available USB 1.1 or 2.0 port
Ethernet network interface

Monitor
Resolution of 1024 x 768 or higher

Operating System
Windows 7 32/64 bit Service Pack 1
Windows 8.1 32/64 bit
Windows 10 64 bit
Microsoft.Net Framework 3.5

IOL PORTABLE

IOL Portable enables the display of measured values as well as the diagnoses and the configuration of IO-Link-capable sensors without additional control. The handheld device enables you to operate IO-Link sensors without additional hardware.

We have set up 3 user levels in IODD for you

- OBSERVER
  Identification, observe, diagnosis
- MAINTENANCE
  Identification, observe, diagnosis, parameter (basic)
- SPECIALIST
  Full access to all provided setting options

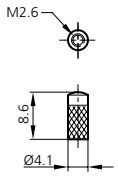
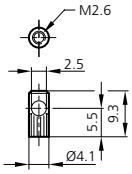
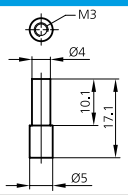
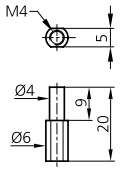
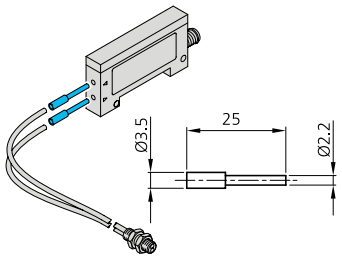
- Universal IO-Link handheld master
- App-based, no prior knowledge necessary
- Integrated touchscreen and plug connectors
- Integrated battery, IO-Link master and WLAN
- For identification, configuration and diagnostics
- IODD download via IODDfinder
- For devices with IODD Specification 1.1

Technical data	+20°C, 24 VDC
Power consumption	80 mA
Inverse polarity protection	Yes
Power supply	24V / 80 mA (IO-Link device from battery)
Housing dimensions	62 x 222 x 90 mm
Housing material	Polycarbonate
Protection class	III, operation on protective low voltage
To be used for	For devices with IODD Specification 1.1
Functions	Without PC
Communication	IO-Link specification V 1.1, IO-Link port class A
Ambient temperature during operation	0 to +40 °C
Protection class	IP 30
Connection	Socket, M8, 3-pin
Connection 2	Socket, M8, 4-pin
Connection 3	Socket, M12, 4-pin

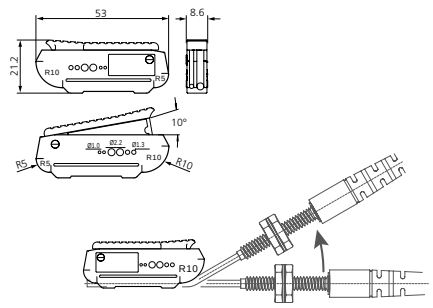
IOL Portable	
Scope of delivery: -IO-Link handheld master -Cable with clamps 0.3 m with M12 connector, 4-pin -Protective bag -Micro-USB cable -Quickstart instructions	IOL Portable

Accessories	
Connection cable (coupling M12, 4-pin / M12 connector, 4-pin)	VSHM-Z-0.6/VKM-Z/4

ACCESSORIES FOR PLASTIC FIBER-OPTIC CABLES

		Light aperture	Thread	Quantity	Product description
Attachment optics for increasing the range for through-beam light barriers with sensor probe thread					
 	To increase the range by up to 400%, installed on the sensor probe of the transmitter.	Axial	M2.6	1	V0 M2.6
 	For beam deflection, installed on the sensor probe of the transmitter.	Radial	M2.6	1	V0 M2.6-90
Attachment optics for light spot focus for diffuse sensors with sensor probe thread					
 	For light spot focus, the light spot size is Ø0.5 at a distance of 8mm.	Axial	M3	1	V0 M3
 	For light spot focus, the light spot size is Ø0.7 at a distance of 10mm.	Axial	M4	1	V0 M4
Adapter					
	For Ø 1mm plastic fiber-optic cables Set consists of two pieces.			2	AK 2.2/1

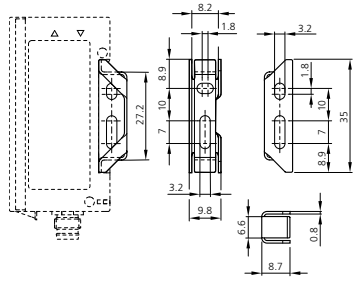
Cutting tool



including bending gauge R10 for fiber-optic cables with bendable sensor probe.

For plastic fiber-optic cables that can be cut to size	SMB 1

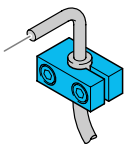
Fastening bracket for fiber-optic sensors

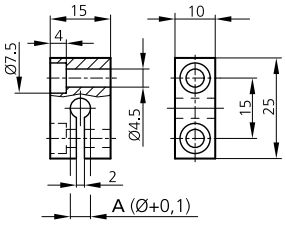


For OLVK 61 …	BW 60
For OLVK 61 …	

ACCESSORIES FOR GLASS FIBER OPTIC CABLES

Terminal block

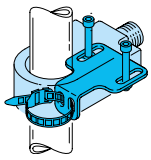




		A = 8.0 mm	KB 8

ACCESSORIES FOR RING SENSORS

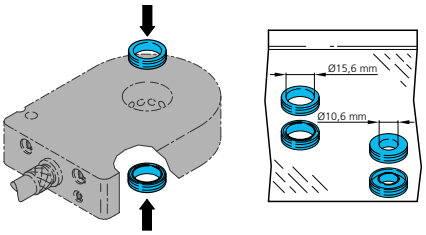
Mounting bracket for ring sensors IRB 6-27



Adapter ring	Ø 15 mm (2x)	BWS-IR01

ACCESSORIES FOR RING LIGHT BARRIERS

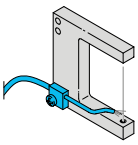
Adapter set for ORSD 20 P2K-IBS ring light barrier



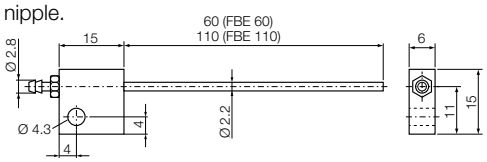
Adapter ring	Ø 10 mm (2x)	
Adapter ring	Ø 15 mm (2x)	ORSD-AR-10/15

ACCESSORIES FOR FORKED AND ANGLED LIGHT BARRIERS

Air nozzles (FBE)

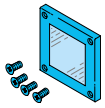


These air blast devices are used to purge dirt and deposits from optics.
They are installed on the forked/angled light barrier, the pneumatic connection is established by means of an M5 hose nipple.



Flexible	Length 60 mm	FBE 60
Flexible	Length 110 mm	FBE 110

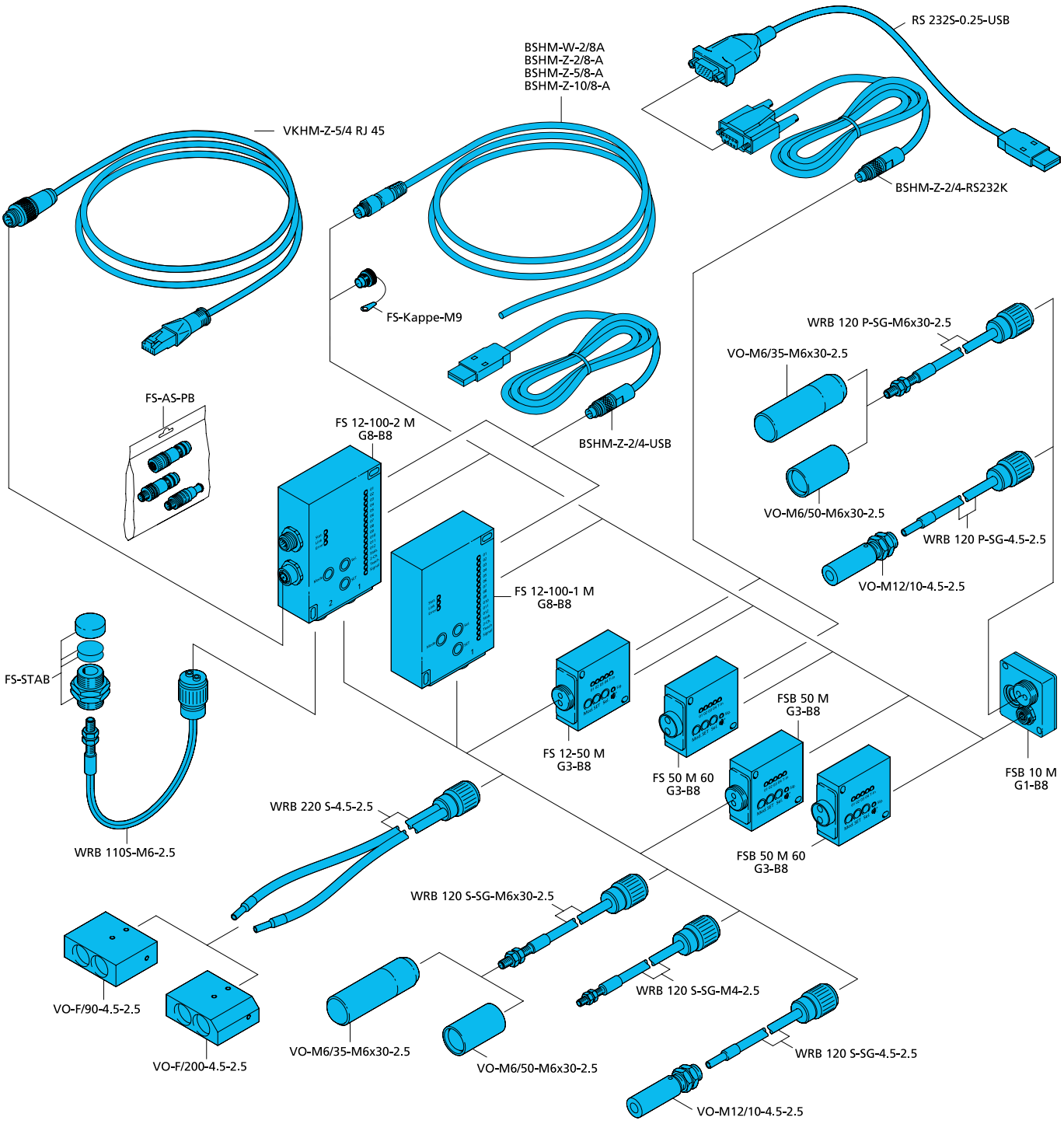
ACCESSORIES FOR OPTICAL DISTANCE SENSORS

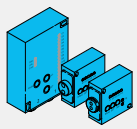
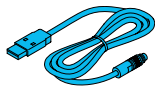
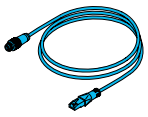
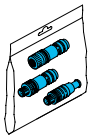
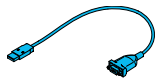
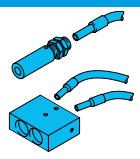
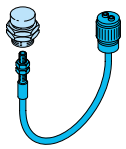
Protective frame with glass insert for LAT 45…		
		
		LHT9-45-SRG

ACCESSORIES FOR ULTRASOUND DISTANCE SENSORS

Deflection angle for ultrasound sensors		
		
	For ultrasound sensors with thread M12	US-UW-12
	For ultrasound sensors with thread M18	US-UW-18

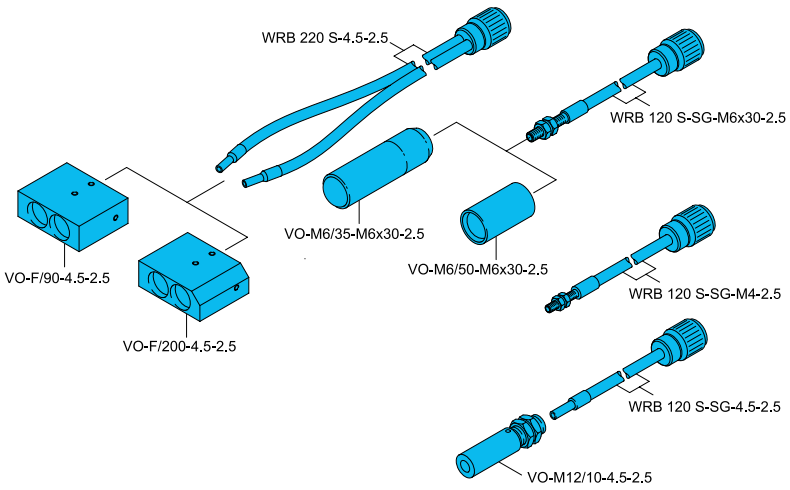
ACCESSORIES FOR COLOR SENSORS



	FSB 10 M G1-B8	FSB 50 M 60 G3-B8	FSB 50 M G3-B8	FS 50 M 60 G3-B8	FS 50 M G3-B8	FS 12-100-1 M G3-B8	FS 12-100-1 M G3-B8-E	FS 12-100-2M G3-B8	FS 12-100-2 M G3-B8-PB	Connections	Cable length (m)	Protection class	Product description
Connection cable													
	■	■	■	■	■	■	■	■	■	Angled M9 connector, 8-pin / flying leads	2.0	IP 67	BSHM-W-2/8A
	■	■	■	■	■	■	■	■	■	Straight connector M9, 8-pin / flying leads	2.0	IP 67	BSHM-Z-2/8A
	■	■	■	■	■	■	■	■	■		5.0	IP 67	BSHM-Z-5/8A
	■	■	■	■	■	■	■	■	■		10.0	IP 67	BSHM-Z-10/8A
Connection cable for computer, connection set for Profibus / Ethernet													
				■	■	■	■	■	■	computer / RS 232	2.0		BSHM-Z-2/4-RS232K
						■	■	■	■	computer / USB	2.0		BSHM-Z-2/4-USB
							■			computer / Ethernet	5.0		VKHM-Z-5/4-RJ45
									■	computer / Profibus	M12, B-coded		FS-AS-PB
Adapter RS232 / USB													
				■	■	■	■	■	■	USB / RS 232	0.25		RS232S-0.25-USB
Fiber-optic cables / focus optics													
	■		■		■	■	■	■	■				Article see “Fiber-optic cables / focus optics” on page 210
Stabilization system													
								■	■		0.3	IP 67	WRB 110 S-M6-2.5
								■	■				FS-STAB

Fiber-optic cables / focus optics

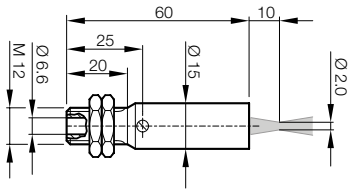
Glass fiber-optic cables feature a robust design. One- or two-armed fiber-optic cables with different sensor probes are available. Focus optics concentrate the light beam down to a small measuring spot diameter and enable color measurement on very small surfaces. The operating range of the focus optics is 10 to 300 mm.



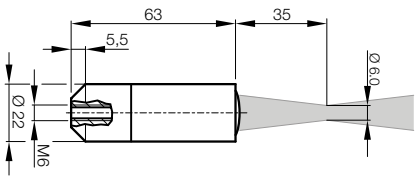
Technical data (typ.)	
Focus optics	
Fiber bundle	Ø 2.5 mm
Material of focus optics	Aluminum, anodized

Focus optics for operation with 1-arm fiber

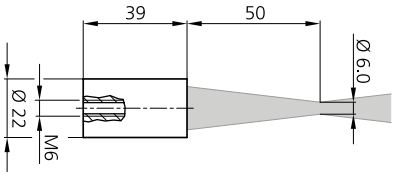
VO-M12/10-4.5-2.5



VO-M6/35-M6x30-2.5

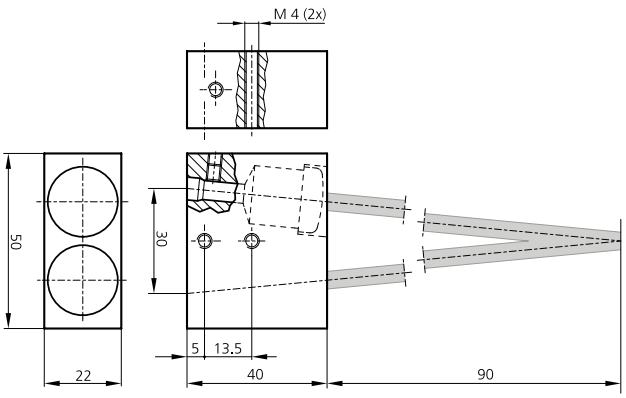


VO-M6/50-M6x30-2.5

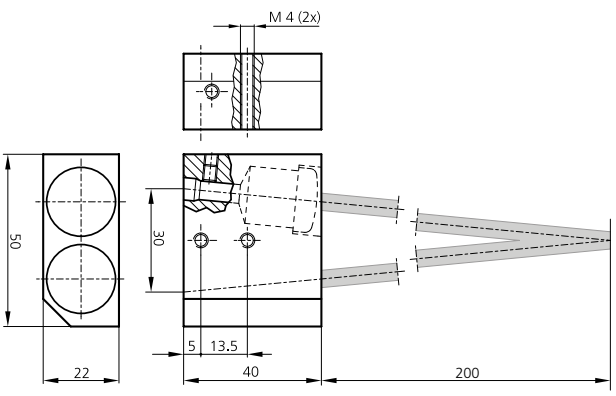


Focus optics for operation with 2-arm fiber

VO-F/90-4.5-2.5



VO-F/200-4.5-2.5



mm (typ.)

Technical data (typ.)		
Fiber-optic cable	**WRB 120 S-SG… / WRB 220 S-4.5-2.5**	**WRB 120 P-SG…**
Active Ø	Ø 2.5 mm	Ø 2.5 mm
Protection class	IP 67	IP 67
Bending radius	≥ 3 x tube Ø	≥ 2 x tube Ø
Material of sensor probe	VA	VA
Material of fibers	Glass fibers	Glass fibers
Material of sheathing	Silicone-metal sleeve	PVC
Length of fiber-optic cable	600 mm	600 mm

		FSB 10 M G1-B8	FSB 50 M G3-B8	FS 50 M G3-B8	FS 12-100-1 M G3-B8	FS 12-100-2 M G3-B8 / … G3-B8-PB	Fastening for fiber-optic cable / focus optics	Measuring spot Ø (mm)	Working distance (mm)	Length (mm)	Single fiber (mm)	Operating range (mm)	Opening angle	Temperature resistance (°C)	Product description
Fiber optics and matching focus optics															
	Fiber optic cable:		■	■	■	■	Ø 4.5			600	0.05 [1]		67 °	-40 to +180	WRB 120 S-SG-4.5-2.5
	Fiber optic cable:	■					Ø 4.5			600			68 °	+80	WRB 120 P-SG-4.5-2.5
	Focus optics	■	■	■	■	■	Ø 4.5	2.0	10			10 to 15			VO-M12/10-4.5-2.5
	Fiber optic cable:		■	■	■	■	M4			600			67 °	-40 to +180	WRB 120 S-SG-M4-2.5
	Fiber optic cable:		■	■	■	■	M6			600	0.05 [1]		67 °	-40 to +180	WRB 120 S-SG-M6x30-2.5
	Fiber optic cable:	■					M6			600			68 °	+80	WRB 120 P-SG-M6x30-2.5
	Focus optics	■	■	■	■	■	M6	6.0	35			30 to 60			VO-M6/35-M6x30-2.5
	Focus optics	■	■	■	■	■	M6	6.0	50			35 to 60			VO-M6/50-M6x30-2.5
	Fiber optic cable:		■	■	■	■	Ø 4.5			600	0.05		67 °	-40 to +180	WRB 220 S-4.5-2.5
	Focus optics		■	■	■	■	Ø 4.5	14	90			70 to 150			VO-F/90-4.5-2.5
	Focus optics		■	■	■	■	Ø 4.5	20	200			150 to 300			VO-F/200-4.5-2.5

[1] Fiber arrangement statistically mixed

Accessories for industrial image processing

di-soric offers an extensive selection of accessories for industrial image processing. The selection is suited perfectly to the various products.

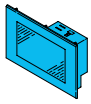
ACCESSORIES FOR CS-50

		Light color				Product description
90° target mask for CS-50						
						
						CS-R90
LED board replacement kit for CS-50						
		IR Infrared				BE-CS-G0
		Red (625 nm)				BE-CS-G1
		Blue (470 nm)				BE-CS-G3
		White (6500 K)				BE-CS-G5
Plates for CS-50						
	Transparent plate	Clear				CS-WINDOWKIT
	For eliminating surface reflections	Diffusor				CS-WINDOWKIT-DIF
		Polarizer				CS-WINDOWKIT-POL
Filters for CS-50						
	For increasing contrast	red				CS-WINDOWKIT-G1
		Blue				CS-WINDOWKIT-G3

VP Multi-functional control panel

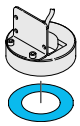
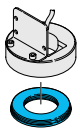
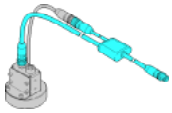
The multifunctional VP operating panel enables the visualization of all image and evaluation data. The devices feature simple rights management, on-the-fly job switching, remote access via VNC and a multicamera mode.

Technical data (typ.)	**at +20 °C**		
Operating principle	Embedded touch screen monitor ARM/Linux-based	Selection of data communication to the camera	All variables linked in AutoVision can be displayed/manipulated
Functions		Mounting	M4 stud bolts (6x)
Communication with camera	CloudLink/Telnet-based	Base languages	German, English, French
Change for camera jobs	Using touch screen		Spanish, Italian and more
Interaction with camera settings	Using touch screen		
Interaction with a job	Using all linked variables/no		

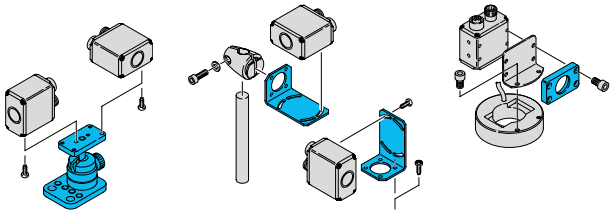
	Screen diagonal	Service voltage (VDC)	Voltage supply	Interfaces	Ethernet	Protection class	Ambient temperature (°C)	Connection (network)	Product description
Multifunctional control panel for Vision Sensors									
	7"	24±5 %	Connector 2-pin	telnet, http, REST Api	■	IP 65 (front side)	0 to +40	RJ 45	VP 700
	10"								VP 1000

Technical data (typ.)	**at +20 °C, 24 V DC**		
Service voltage	22 to 30 V DC	Protection class	IP 67
Power	23 W (24 V DC)	Protection class	III, operation on protective low voltage
Shock/vibration load	30 g / 10 - 55 Hz, 1 mm	Plug connector	M12
Ambient temperature	0 to +40 °C	Weight	80 g
Housing material	Aluminum, black anodized		
Window material	PMMA, clear		

	Dispersion angle	Light color	Risk group (DIN EN 62471)	Light intensity at 0.1 m	Light intensity at 0.3 m	Light intensity at 0.5 m	Product description
Ringlight							
 Ø 33	90°	IR Infrared, 850 nm	Open	11,800 µW/cm²	1,720 µW/cm²	640 µW/cm²	BEK-R33-E0T-K-BS
	80°	Red, 625 nm	Open	29,000 lux	3,370 lux	1,450 lux	BEK-R33-E1T-K-BS
	80°	White, 6,000 K	Open	51,300 lux	7,100 lux	2,500 lux	BEK-R33-E5T-K-BS

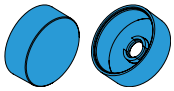
Accessories for operating the CS-50 with a BEK-R33 … ringlight		
	Polarization film for affixing to the ringlight BEK-R33 …	BEK-R33-POL
	Focus optics for use with the ringlight BEK-R33 …	BEK-R33-FOK
	Y-distributor cable for CS-50 and BEK-R33	CS-Y-0.3/12-A

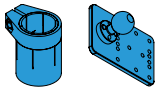
Mounting technology



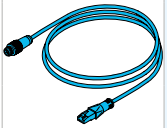
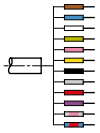
see “Mounting technology for industrial image processing / identification systems”, page 242

ACCESSORIES FOR CS-60

	Transmission	Material	Weight (g)	Component				Product description
Diffuser for CS-60								
	90 %	PVAL (optical film) PMMA (lens cover)	10	Diffuser				CS60-WINDOW-DIFFUS
Optics lens cover polarizing film for CS-60								
	40 %	PVAL (optical film) PMMA (lens cover)	10	Polarizer				CS60-WINDOW-POLAR
Safety screen for CS-60								
	92 %	PMMA (lens cover)	10	Safety screen				CS60-WINDOW

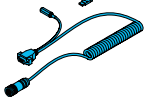
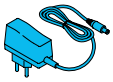
	Size	To be used for	Housing material	Scope of delivery	Product description
Holding system for CS-60					
	75.0 x 50.0 x 35.0 mm	Vision sensors CS-60	Aluminum	1 mounting plate (CS 60), 1 ball-shaped head, 1 ball housing, mounting material	HS-VS-CS60-MP-KK-M3

CONNECTION LINES FOR VISION SENSORS

	Ethernet	I/O	Coupling	Cable length (m)	Connector	Protection class	Cable material	Drag chain compatible	for CS-50	for CS-60	Product description
Ethernet cable for Vision Sensors											
	■			2.0		IP 67	PUR		■		VKHM-Z-2/RJ45
				5.0		IP 67	PUR		■		VKHM-Z-5/RJ45
				10.0		IP 67	PUR		■		VKHM-Z-10/RJ45
				5.0		IP 67	PUR		■		VKHM-W-5/RJ45
				2.0		IP 20		■		■	VSHM-Z-2/RJ45-X
				5.0		IP 20		■		■	VSHM-Z-5/RJ45-X
				10.0		IP 20		■		■	VSHM-Z-10/RJ45-X
				15.0		IP 20		■		■	VSHM-Z-15/RJ45-X
				20.0		IP 20		■		■	VSHM-Z-20/RJ45-X
I/O cables for Vision Sensors											
		■		5.0		IP 67	PVC		■	■	VKHM-Z-5/12-A
				5.0		IP 67	PUR	■	■	■	VKSM-Z-5/12-A
				10.0		IP 67	PUR	■	■	■	VKSM-Z-10/12-A
				10.0		IP 67	PUR		■	■	VKHM-Z-10/12-A
				15.0		IP 67	PUR	■	■	■	VKSM-Z-15/12-A
				20.0		IP 67	PUR	■	■	■	VKSM-Z-20/12-A
				5.0		IP 67	PUR		■	■	VKHM-W-5/12-A-CS
				25.0		IP 67	PUR		■	■	VKHM-Z-25/12-A
				30.0		IP 67	PUR		■	■	VKHM-Z-30/12-A
				35.0		IP 67	PUR		■	■	VKHM-Z-35/12-A
I/O extension cables for Vision Sensors											
		■		5.0		IP 67	PUR		■	■	VSSM-Z-5/VKM-Z/12
				0.2		IP 67	PUR			■	VSHM-Z-0.2/4/VKM-Z/12-A-CS60

Identification system accessories

di-soric offers an extensive selection of accessories for its identification systems, perfectly matched to its various products.

	ID-10-IM3-2-US	ID-80-IM3-2-S	ID-80-IM3-2-U	ID-100-IM3-2-US	ID-200-IM3-2-US	Designation	Note	Cable length (m)	Product description
Brackets									
	■					Stand	Material: Plastic		ID-10-STAND
		■	■	■		Wall bracket	Material: POM		ID-100-WBKT
					■	Wall bracket	Material: POM		ID-200-WBKT
					■	Wall bracket	Material: POM conducive ESD-Safe		ID-200-WBKT-ESD
Protective cover sets									
					■	ID-200 protective cover set	For protecting the optics and protecting the lighting against contamination and damage Material: POM / glass		ID-200-CVR-SET
					■	ID-200 protective cover set	For the protection of the optics and lighting against contamination and damage Material: POM / glass ESD-Safe		ID-200-CVR-SET-ESD
Connection cable / converter									
	■	■	■	■		Connection cable	RJ50 / USB	2.4	ID-K-RJ50/U-2.4
	■	■		■		Connection cable	RJ50 / Sub-D / DC Jack	2.4	ID-K-SD/DCJ-RJ50-2
	■		■	■	■	USB converter		0.5	VSIK-K-S/U
					■	Connection cable	M12,12-pin / USB	2.0	ID-K-M12/U-2
					■	Connection cable	M12,12-pin / Sub-D/DC Jack	Coiled cord 2.0	ID-K-SD/DCJ-M12-2
					■	Connection cable	M12,12-pin / Sub-D/DC Jack	Coiled cord 5.0	ID-K-SD/DCJ-M12-5
	■	■		■	■	Serial Keyboard Converter	Serial / USB 9600 BPS German keyboard	1.8	ID-SERIALKEYBOARDCONVERT
Power supply unit and energy supply									
	■	■		■	■	Power supply unit	Supply voltage: 230 V Service voltage: 5 V DC		ID-PS-230/5V-DCJ

Safety technology accessories

Coordinated accessories for quick installation and commissioning complements the safety technology product range from di-soric. It includes connection and fastening technology as well as utilities for adjusting and checking safety functions.

MOUNTING COLUMNS

Robust mounting columns for safety light curtains / grids protect them and offer a robust fastening option on the floor. Mounting columns with deflection mirrors are also part of the product range, which enable circumferential protective fields with up to four sides. A mounting base with an adjusting function facilitates and speeds up mounting.

Mounting columns

- Effortless installation and removal of the light curtains / grids with the option of easy height adjustment of the first beam
- Models with a rear PG11 connection are also available
- Columns made from extruded aluminum with adjustable angular orientation
- Steel base for floor mounting, with options for adjusting the vertical column axis
- Integrated spherical spirit level for checking correct vertical positioning
- Steel anchor bolts are included in the scope of delivery for the base

FMC-EBx

FMC-B12

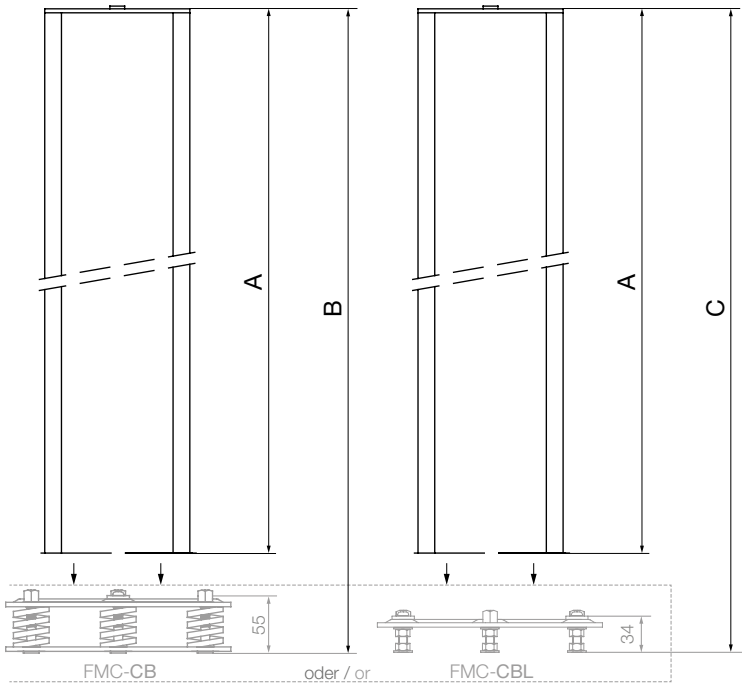
Mounting columns with deflection mirrors

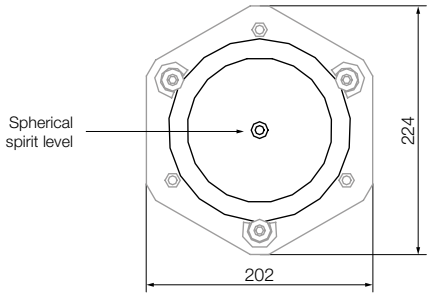
- Pre-mounted deflection mirrors for creating circumferential protective field heights with up to 4 sides
- Models with pre-mounted and freely adjustable deflection mirrors for safety light grids with 2, 3 or 4 beams are also available
- Special models equipped with a protective anti-fragmentation film on the mirrors available upon request
- Columns made from extruded aluminum with adjustable angular orientation
- Steel base for floor mounting, with options for adjusting the vertical column axis
- Optical power reduction factor 15% for each mirror
- Integrated spherical spirit level for checking correct vertical positioning
- Steel anchor bolts are included in the scope of delivery for the base

FMC-SB

FMC-S

Mounting columns with base

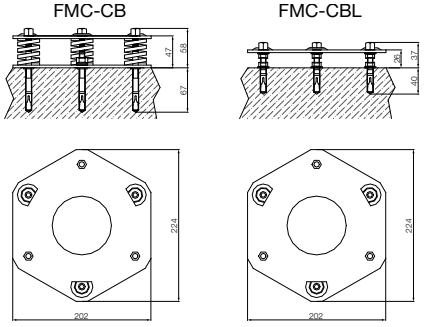




A (mm)	B (mm)	C (mm)	Product description
for SLB / SLI light grids			
1,000	1,055	1,034	FMC-EB2
			FMC-EB2R
1,330	1,385	1,364	FMC-EB4
			FMC-EB4R
for SLB / SLI light curtain			
1,670	1,725	1,704	FMC-EB1700
			FMC-EB1700R
1,970	2,025	2,004	FMC-EB2000
			FMC-EB2000R
1,200	1,255	1,234	FMC-B12
With deflection mirrors for SLB / SLI light grids			
1,000	1,055	1,034	FMC-S2
			FMC-SB2
1,200	1,255	1,234	FMC-S3
			FMC-SB3
1,330	1,385	1,364	FMC-S4
			FMC-SB4
With SLB / SLI deflection mirrors for light curtain			
1,670	1,725	1,704	FMC-S1700
1,970	2,025	2,004	FMC-S2000
For SLM4 light grids			
1,000	1,055	1,034	FMC-SGB2
1,200	1255	1234	FMC-SGB3
1,330	1,385	1,364	FMC-SGB4
For SLM4 light curtain			
1,670	1,725	1,704	FMC-SG1700
1,970	2,025	2,004	FMC-SG2000

The adjustable steel bases FMC-CB or FMC-CBL are required to ensure optimum mounting of mounting columns on the floor.

Base for mounting columns



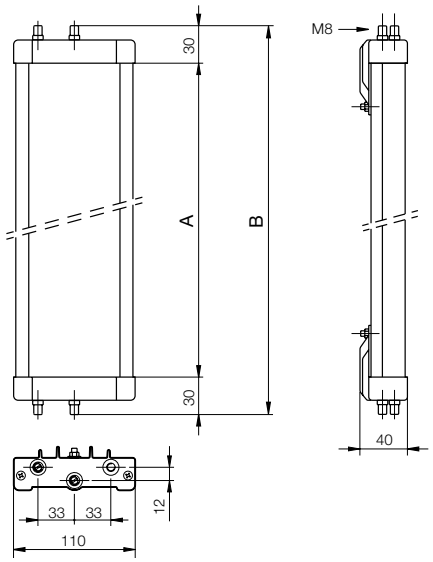
Dimensions 202 x 224 x 58 mm	FMC-CB *
Dimensions 202 x 224 x 37 mm	FMC-CBL

Steel anchor bolts are included in the scope of delivery
Order a base for each respective column.

* The steel bases **FMC-CB** can be adjusted precisely. They consist of a double plate with steel springs for fine adjustment

		For light curtains / grids with…					
		Protective field height up to 1,210 mm	Protective field height up to 1,810 mm	2 beams	3 beams	4 beams	Product description
Mounting columns for SLB / SLI light curtains / grids							
	Without PG11 connection			■			FMC-EB2
					■	■	FMC-EB4
		■					FMC-EB1700
			■				FMC-EB2000
	With PG11 connection			■			FMC-EB2R
					■	■	FMC-EB4R
		■					FMC-EB1700R
			■				FMC-EB2000R
Aluminum profile with fastening grooves				■	■	■	FMC-B12
Mounting columns with deflection mirrors for SLB / SLI							
	Premounted deflection mirror			■			FMC-S2
					■		FMC-S3
						■	FMC-S4
		■					FMC-S1700
			■				FMC-S2000
	Freely adjustable deflection mirrors			■			FMC-SB2
					■		FMC-SB3
						■	FMC-SB4
Base for mounting columns for SLB / SLI							
	202 x 224 x 58 mm	■	■	■	■	■	FMC-CB
	202 x 224 x 37 mm						FMC-CBL

DEFLECTION MIRRORS

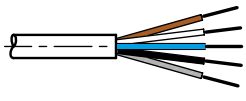
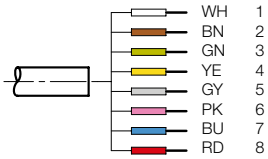
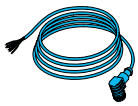
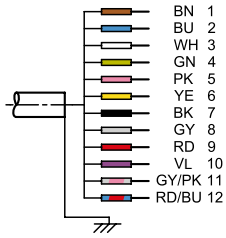
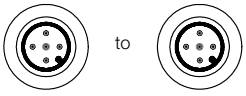
	A (mm)	B (mm)	Dimensions (mm)	For light curtains with a protective field height of (mm):	For Light curtains / grids: 2 beams	3 beams	4 beams	Product description
Deflection mirror for SLB / SLI								
	250	310	310 x 110 x 40	160				SP 100 S
	400	460	460 x 110 x 40	310				SP 300 S
	540	600	600 x 110 x 40	460				SP 400 S
	715	775	775 x 110 x 40	610	■			SP 600 S
	885	945	945 x 110 x 40	760				SP 700 S
	1,060	1,120	1,120 x 110 x 40	910		■		SP 900 S
	1,230	1,290	1,290 x 110 x 40	1,060			■	SP 1100 S
	1,400	1,460	1,460 x 110 x 40	1,210				SP 1200 S
	1,450	1,510	1,510 x 110 x 40	1,360				SP 1300 S
	1,600	1,660	1,660 x 110 x 40	1,510				SP 1500 S
	1,750	1,810	1,810 x 110 x 40	1,660				SP 1600 S
	1,900	1,960	1,960 x 110 x 40	1,810				SP 1800 S

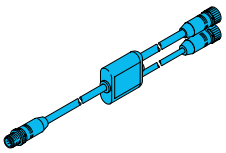
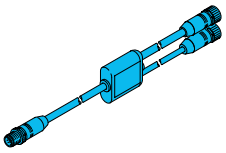
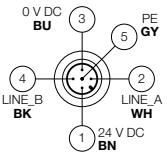
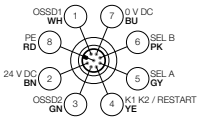
When using deflection mirrors, the following must be taken into account:

- The working distance (range) results from the sum of the lengths of all access sides of the monitored area.
- The maximum usable range between the transmitter and receiver is reduced by 15% for each mirror.
- The mirrors must be positioned so that the safety distance on each access side to the hazard zone can be maintained.
- If protective devices are implemented across long distances and are equipped with deflection mirrors on multiple sides, the LAD 4 laser alignment device should be used to align the light curtains / grids with each quickly and correctly (see page 229).

CONNECTION TECHNOLOGY

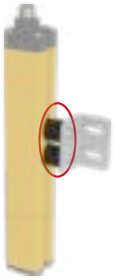
In the field of connection technology, the widest range of electrical contacts are available for individual, industrial mounting.

		straight	angled	Cable length (m)	Product description
Connection cable for SLB2 ... SLBx4... and for SLI2..., SLIx4... SLM4 transmitters					
	 M12, 5-pin socket, at open end	■		5	CD 5
				10	CD 10
				15	CD 15
				20	CD 20
				25	CD 25
				50	CD 50
			■	5	CD 95
				10	CD 910
				15	CD 915
Connection cable for SLI2..., SLIx4... receivers					
	 M12, 8-pin socket, at open end	■		5	C8D 5
				10	C8D 10
				15	C8D 15
				25	C8D 25
				40	C8D 40
			■	5	C8D 95
				10	C8D 910
				15	C8D 915
Connection cable for SLM4 receivers					
	 M12, 12-pin socket, at open end	■		3	CS12D3
				5	CS12D5
				10	CS12D10
				15	CS12D15
				20	CS12D20
Connection cable between SLI2..., SLIx4... master and slave					
	 M12, 5-pin socket to M12, 5-pin socket	■		0.3	CDS 03
				3	CJBE 3
				5	CJBE 5
				10	CJBE 10
				25	CJBE 25

			straight	angled	Cable length (m)	Product description
Connection cable between SLM4PO and PC						
		Socket M12, 5-pin, to USB, type A plug	■		2	CS12 USB
T-piece for muting arms MZ-T4P, transmitter						
		Connector M12, 5-pin,(1x) socket M12, 5-pin,(2x)	■		0.4	CSY12-TX
T-piece for MZ-T4P muting arms, Receiver						
		Connector M12, 5-pin,(1x) socket M12, 5-pin,(2x)	■		0.4	CSY12-RX
Field-attachable plug connector for SLB2…, SLBx4… and for SLI2…, SLIx4… SLM4 transmitters						
		M12 socket, 5-pin, with screw terminals and PG9 screw connection	■			CDM 9
				■		CDM 99
Field-attachable plug connector for SLI2…, SLIx4… receivers						
		M12 socket, 8-pin, with screw terminals and PG9/11 screw connection	■			C8D M 11
				■		C8D M 999

MOUNTINGS FOR SAFETY TECHNOLOGY

di-soric offers rigid and adjustable brackets for its safety light curtains / grids for quick mounting as well as dampers to protect the light curtains / grids from strong vibrations. The fasteners can be mounted and aligned quickly, resulting in high machine availability.

		For light curtains / grids: up to protective field height (mm)	SLB / SLI	SLM4	Adjustment range up to	Pieces / set	Product description
Standard brackets for light curtains / grids							
	Each set includes the brackets required for transmitters and receivers. A set is already included in the scope of delivery for every light curtain / grid.	1,060	■		–	4	SA 4
		1,210	■		–	6	SA 6
Adjustable brackets SFB 4... / SFB 6...							
	Each set includes the brackets required for transmitters and receivers.	1,060	■		14°	4	SFB 4E
		1,060		■	14°	4	SFB 4SG
		1,210	■		14°	6	SFB 6E
		1,210		■	14°	6	SFB 6SG
Adjustable brackets SFB E 180 [1]							
	Each set includes the brackets required for transmitters and receivers.	–	■		180°	4	SFB 180E
Anti-vibration dampers [2] for light curtains / grids SLB / SLI							
	Each set includes the dampers necessary for transmitters and receivers.	160	■		–	4	SAV 4E
		260 to 1,060	■		–	8	SAV 8E
		1,210 to 1,810	■		–	12	SAV 12E

[1] The brackets SFB E enable the light curtains / grids to be rotated along the longitudinal axis as well as allowing the vertical and horizontal position to be adjusted. The use of SFB E brackets is recommended for the alignment of light curtains / grids that operate over long distances or on multiple sides using deflection mirrors.

[2] Unprotected safety light curtains / grids can be severely damaged if they are subjected to strong vibrations.
For example, these vibrations occur with presses, weaving machines, etc. which can then be transferred to the attached light curtains / grids. In these cases, the use of vibration-damping brackets is highly recommended!
SAV vibration dampers can easily reduce vibrations caused by such machines, thereby preventing damage to the light curtains / grids using deflection mirrors.

SAFETY SCREENS

The PSE safety screens, made of polycarbonate, protect the front screen of the safety light curtains/grids from damage. Thanks to quick and simple mounting with the SFS E fastener set, the safety screen can be exchanged problem-free in the event of damage.

Safety screens

Fastening set

End cap

Clamps

	For the protective field height (mm)	Product description
Protective screens for SLB / SLI **safety light curtains**		
	160	PSE 150
	310	PSE 300
	460	PSE 450
	610	PSE 600
	760	PSE 750
	910	PSE 900
	1,060	PSE 1050
	1,210	PSE 1200
	1,360	PSE 1350
	1,510	PSE 1500
	1,660	PSE 1650
	1,810	PSE 1800
Safety screens for safety light grids		
Safety screen set for 2-beam light grid	510	PSE 2B
Safety screen set for 3-beam light grid	810	PSE 3B
Safety screen set for 4-beam light grid	910	PSE 4B

Fastening set for PSE safety screens	
Stainless steel clamps and end caps for safety screens	SFS E

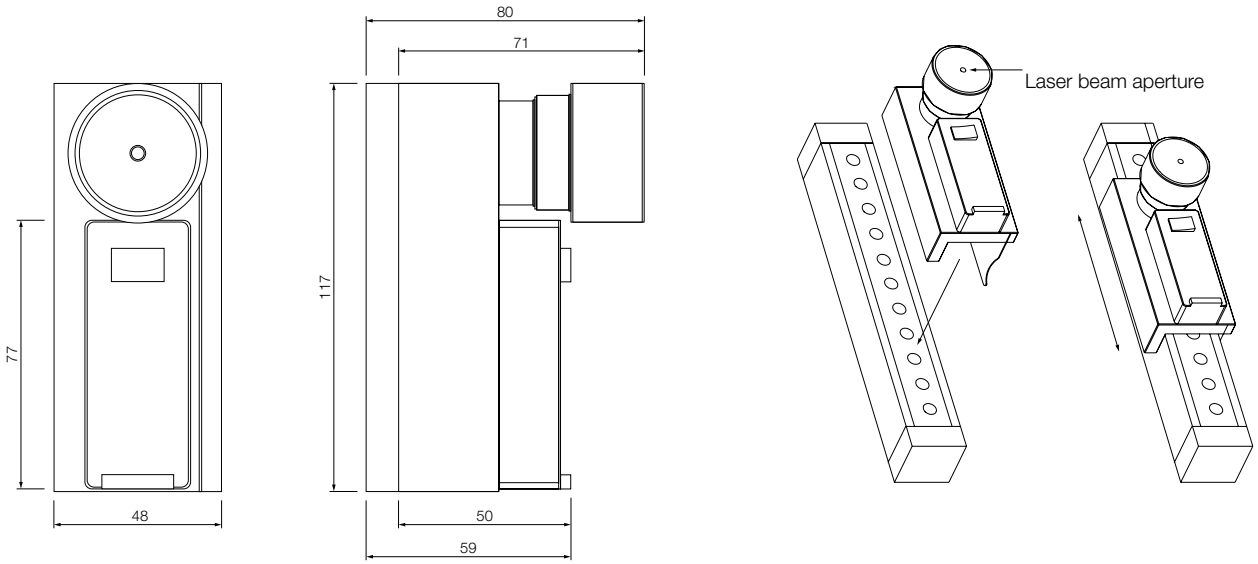
LASER ALIGNMENT AID

The laser alignment aid enables fast and reliable alignment of safety light curtains / grids using a visible red light laser. This product can be used for the ideal alignment of safety light curtains / grids that are used over large distances or on multiple sides using deflection mirrors.

Technical data (typ.)	+20 °C, 24 V DC
Emitted light	Red-light laser, 650 nm
Laser safety class	II (EN 60825-1)
Range	100 m
Laser beam divergence	< 0.5 mrd
Laser power	1,000 µW
Service voltage	3 V DC
Power supply	2x 1.5 V alkaline batteries type AAA
Housing material	Plastic
Fastening type	Quick fastening to the light curtain / grid or the mounting column
Dimensions H x L x D	117 x 48 x 80 mm

Laser alignment aid

Dimensions in mm:



LAD 4

TEST RODS

The test rod is a cylinder made of aluminum with a matte surface. After installation of the safety light curtains / grids, it is used to check their safety function.

	For light curtains with resolution (mm)	Diameter (mm)	Product description
Test rods for light curtains			
	14 mm	Ø 14	TR 14
	20 mm	Ø 20	TR 20
	30 mm	Ø 30	TR 30
	40 mm	Ø 40	TR 40
	50 mm	Ø 50	TR 50

Lighting accessories

di-soric offers an extensive selection of accessories for its lighting, perfectly matched to the various products.

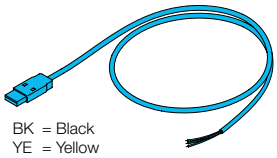
ACCESSORIES FOR IMAGE PROCESSING LIGHTING

Various controllers are used as accessories for the operation of all externally flashable lighting for industrial image processing.

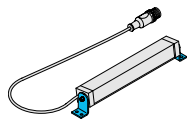
Technical data (typ.)	+20 °C, 24 V DC
Service voltage	24 V DC ± 1
Trigger input	5 to 24 V DC potential-free, optocouplers
Trigger output	12 V DC, push-pull, pnp, npn configurable (max. 150 mA)
Ready output	12 V DC, push-pull, pnp, npn configurable (max. 150 mA)
Input power at 24 V DC	Max. 55 W
Protection class	III, operation on protective low voltage
Inverse polarity protection	In pairs by terminal group
Short-circuit protection	In pairs by terminal group
Operating display	LED: Green, LED: Yellow (flashing), LED: Red (fault)
Shock/vibration load	10 to 55 Hz / 1.0 mm / 30 g
Ambient temperature	0 to +40 °C
Protection class	IP 40
Housing material	Aluminum anodized, PA 6.6 FR

c UL us LISTED

CE

	Average / Peak power consumption	LED constant current (configurable)	LED pulse current (configurable)	Pulse duration (configurable)	Pulse cycle time (configurable)	Pulse delay (configurable)	RS 485 point-to-point connection	Terminal strip	Product description
Flash controller for flashable lighting									
	< 2.5 A 6.0 A	0.1 to 1.8 A	0.1 to 20.0 A	10 µs to 50 ms	100 µs to 60 s	≥50 µs (0 to 2 A) ≥5 µs (2 to 20 A)	■	12-pin	BC-100-20A
Requirements for the power unit									
24 V DC, 6 A									
Interface adapter 1.8 m, RS485 / USB									
 GND Data-(B) Data+(A) BK = Black YE = Yellow OG = Orange									RS485-1.8-USB

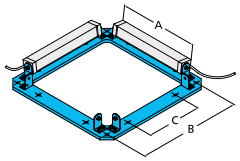
Mounting bracket for barlights



- Stepless adjustment
- Packing unit 2 pieces

compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
■	■	■								BW-BE 1-A

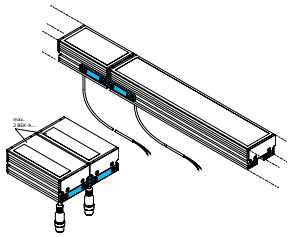
Mounting frame for barllights



- Stepless adjustment
- For up to four lights
- The bracket and mounting materials for four lights are included in the scope of delivery

compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
■										BE 1-A65-FRAMESET
	■									BE 1-A130-FRAMESET
		■								BE 1-A240-FRAMESET

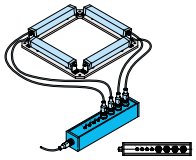
Mounting set for barlights



- Crossbar to cascade two barlights
- Set consists of:
  Aluminum crossbars, anodized black (2 pcs.)
- Required screws and washers

compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
			■	■	■	■	■	■	■	BEK-A-MOUNTINGSET

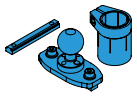
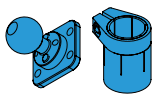
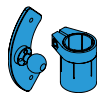
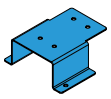
Distributor box for barlights



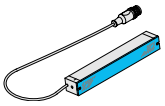
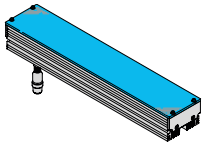
- Four M12 sockets, individually switchable
- Trigger signal, looped through
- Current-carrying capacity 4,000 mA

compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
■	■	■								BEV-200/4-IBS

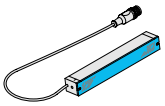
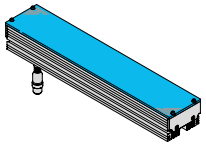
System holder for lighting

	Size (mm)	Housing material	Scope of delivery	Compatible with: BEK-A	BEK-P	BEK-R70	BEK-FL	Product description
	50.0 x 6.9 x 4.6	Aluminum	1 slot nut (BEK-A), 1 ball-shaped head (with foot plate), 1 ball housing, mounting material	■				HS-BE-A-NS-TN-M4
	30.0 x 32.0 x 35.0	Aluminum	1 adapter plate (BEK-P), 1 ball-shaped head, 1 ball housing, mounting material		■			HS-BE-P-MP-KK-M4
	29.0 x 35.0	Aluminum	1 adapter plate (BEK-R70), 1 ball-shaped head, 1 ball housing, mounting material			■		HS-BE-R-MP-KK-M4
	65.0 x 65.5 x 25.0	Stainless steel (V2A)	1 adapter plate (BEK-F - CS 60), mounting material				■	HS-BE-FL-MP-VS-M3

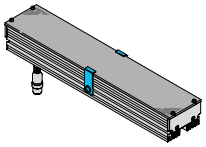
Diffusor for barlights

			compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
	▪ PMMA ▪ Material thickness 3 mm	81 mm	■										BE 1-A65-DIF
		141 mm		■									BE 1-A130-DIF
		251 mm			■								BE 1-A240-DIF
	▪ Homogeneous light reduction ▪ Can be retrofitted quickly and easily ▪ Scratch-resistant safety screen ▪ Mounting materials included in scope of delivery	113 mm				■					■		BEK-A100-DIF [1]
		213 mm					■						BEK-A200-DIF
		313 mm						■				■	BEK-A300-DIF [2]
		413 mm							■				BEK-A400-DIF [3]
		513 mm								■			BEK-A500-DIF [3]

Polarizer for barlights

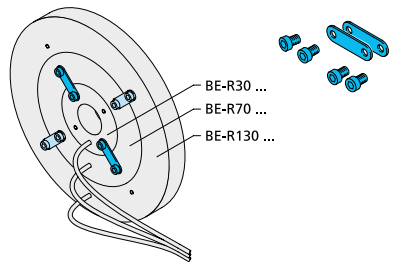
			compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
	▪ PMMA ▪ Material thickness 3 mm	81 mm	■										BE 1-A65-POL
		141 mm		■									BE 1-A130-POL
		251 mm			■								BE 1-A240-POL
	▪ To reduce glare or highlights ▪ Can be retrofitted quickly and easily ▪ Scratch-resistant safety screen ▪ Mounting materials included in scope of delivery ▪ High-temperature resistant: For a pulse / pause ratio of the lighting, up to 100%	113 mm				■					■		BEK-A100-POL [1]
		313 mm					■					■	BEK-A300-POL [2]
		513 mm								■			BEK-A500-POL [3]

Hold-down device set for barlights

			compatible with: BE 1-A 65 …	BE 1-A 130 …	BE 1-A 240 …	BEK-A100 …	BEK-A200 …	BEK-A300 …	BEK-A400 …	BEK-A500 …	BE-A100 …	BE-A300 …	Product description
	▪ For holding down attachment panels that have a length of 300 mm or longer ▪ Set consists of: -Hold-down devices (2x) -Mounting material							■	■	■		■	BEK-A-NH

[1] Delivery does not include a BEK-A-NH hold-down device set
[2] Delivery includes a BEK-A-NH hold-down device set
[3] Delivery includes two BEK-A-NH hold-down device sets

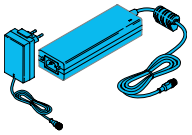
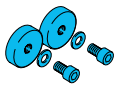
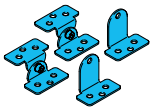
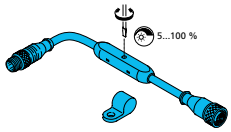
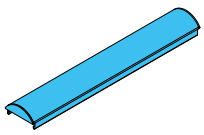
Mounting set for ring lighting



For connecting two lights of adjacent design sizes to a single unit
Set consists of two connecting elements and four M4x6 cheese-head screws. For installing all three lights into a single unit, two BE-R-MOUNTINGSETs are required.

BE-R-MOUNTINGSET

ACCESSORIES FOR MACHINE AND SIGNAL LIGHTING

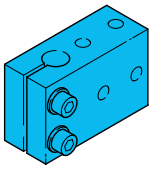
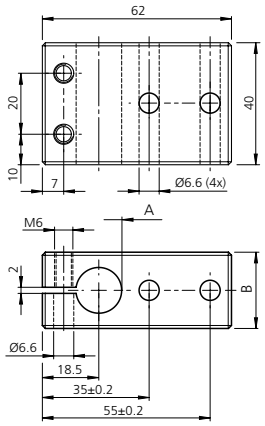
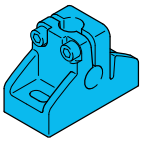
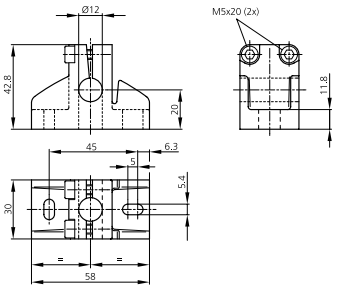
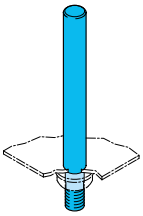
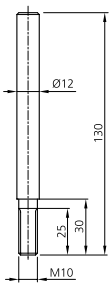
		Compatible with: MB-N-12x-K-B3	MB-N-12x-K	MB-N-25x-K-B3	MB-N-25x-K	MB-N-48x-K-B3	MB-N-48x-K	MB-N-70x-K-B3	MB-N-70x-K	MB-N-91x-K-B3	MB-N-91x-K	MB-NP-250-K	MB-NP-480-K	Product description
Power supply for machine lighting														
		■	■	■	■	■	■	■	■	■	■	■	■	PS-24V/0.9
		■	■	■	■	■	■	■	■	■	■	■	■	DPS-24V/4.0
Magnetic holder set for machine lighting														
	▪ Adhesive force 3.6 kg (2x)	■	■											MB-MHS
	▪ Adhesive force 9.0 kg (2x)			■	■	■	■	■	■	■	■	■	■	MB-MHS-2
Mounting bracket for machine lighting														
	▪ Stepless adjustment	■	■	■	■	■	■	■	■	■	■	■	■	BW-MB
PWM dimmer for machine lighting														
	▪ Pulse width modulation ▪ Dimming range 5 to 100 %		■	■	■	■	■	■	■	■	■			MB-DIM 2
Plug connector for machine lighting														
	▪ M12, 4-pin				■		■		■		■	■	■	BK-Z-12
Diffuser for machine and signal lighting														
	▪ For homogeneous light reduction and illumination ▪ Simple installation by means of a locking groove	■	■											MB-DIF-R-125
				■	■									MB-DIF-R-250
						■	■							MB-DIF-R-480
								■	■					MB-DIF-R-700
										■	■			MB-DIF-R-910

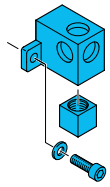
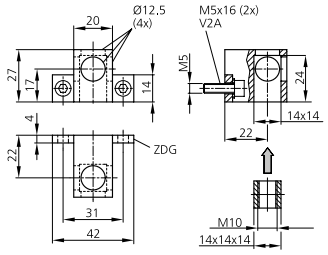
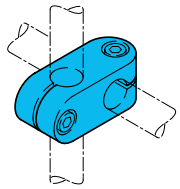
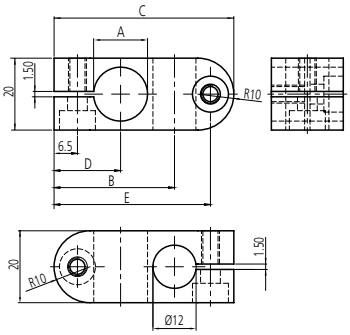
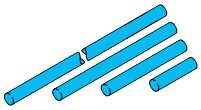
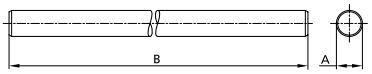
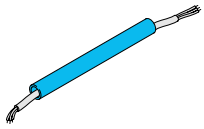
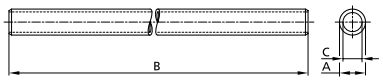
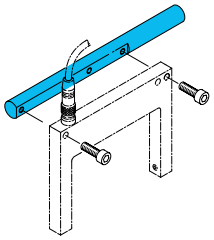
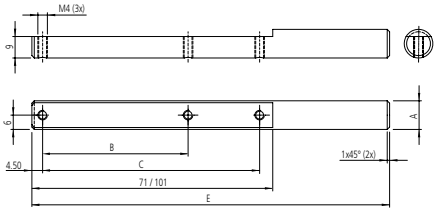
Mounting technology

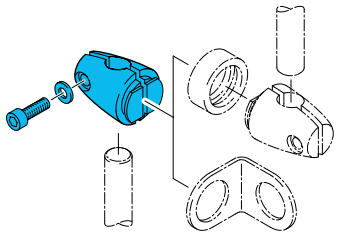
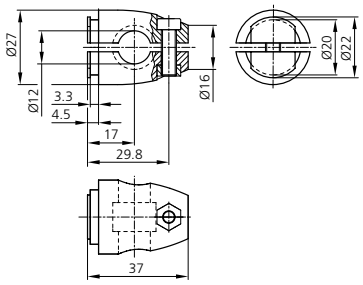
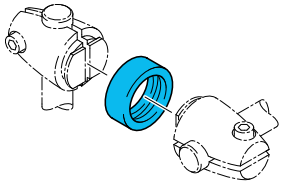
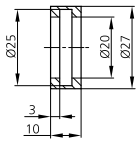
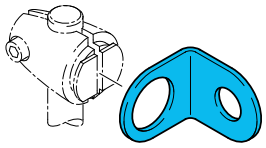
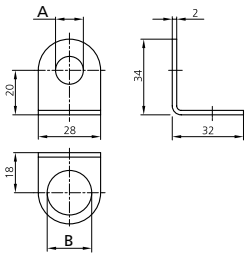
di-soric offers customized bracket and mounting systems for all of its sensors, image processing and identification systems as well as lighting.

UNIVERSAL FASTENERS AND HS MOUNTING SYSTEMS

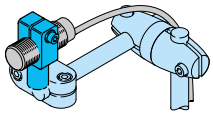
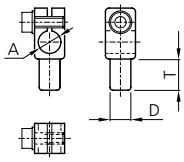
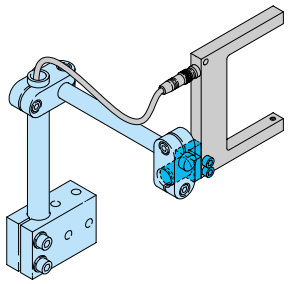
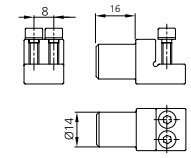
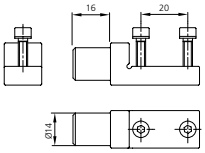
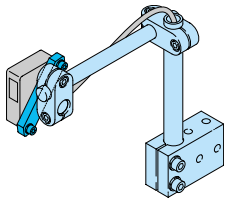
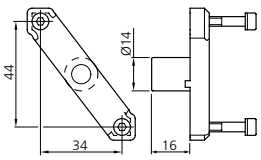
Our universal fasteners are designed for secure and adjustable mounting of the various sensors and lighting systems. A range of system and sensor brackets enable an individual solution and an optimal adaptation to your applications.

		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Material	Product description
Basic holder								
		12	20				Aluminum	HS-GH-12-A
		15	25					HS-GH-15-A
Basic holder								
							Aluminum	HS-GH-3-12-A
Mounting rod Ø12mm								
							VA	HS-S-12-130-M10

		A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Material	Product description
Basic holder for mounting rod HS-S-12-130-M10								
							Die-cast zinc	HS-GH-12
Cross connector								
		Ø10	31.5	48	16.5	41.5	Aluminum	HS-K-10-12-A
		Ø12	31.5	48	16.5	41.5		HS-K-12-12-A
		Ø14	33.5	50	18.5	43.5		HS-K-14-12-A
		Ø15	33.5	50	18.5	43.5		HS-K-15-12-A
Mounting rods								
		Ø12	100				VA	HS-S-12-100-V
		Ø12	200					HS-S-12-200-V
		Ø12	500					HS-S-12-500-V
		Ø15	100					HS-S-15-100-V
		Ø15	200					HS-S-15-200-V
		Ø15	500					HS-S-15-500-V
Mounting tube								
		Ø15	150	12			VA	HS-R-15-150-V
Product holder								
		Ø12	61	-		120	VA	HS-PH-12-120-V
		Ø12	61	91		150		HS-PH-12-150-V

		A (mm)	B (mm)		Material	Product description
Clamping cylinder for mounting rods Ø 12 mm						
				Ø12.5/Ø20	VA	HS-KL-12-20-V
Adapter ring for connecting two clamping cylinders						
				Ø20/Ø20	VA	HS-AR-KL-20
Mounting bracket						
		Ø12.5	Ø20		VA	HS-BW-12
		Ø18.5	Ø20			HS-BW-18

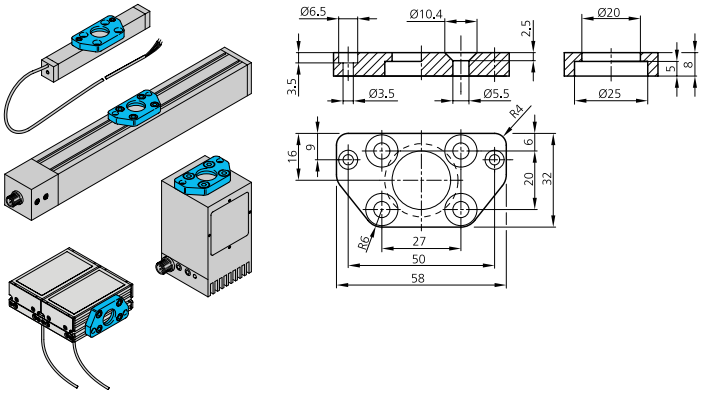
FASTENERS FOR SENSORS

		A (mm)	D (mm)	T (mm)	Material	Product description
Holder for cylindrical housing designs						
		6.5	10	16	Polyamide	SH-6.5-10
		8	10	16		SH-8-10
		12	10	16		SH-12-10
Holders for fork and angled light barriers						
		For angled light barriers OGL…-TSSL OGLP…-TSSL For fork light barriers Fork width of up to 100 mm			Plastic	SH-UGU-08-14
		For fork light barriers Fork width of 100 mm or greater			Plastic	SH-UGU-20-14
Holder for light barriers in the 50 housing series						
		For light barriers in the 50 housing series			Plastic	SH-S50-34-44-14

MOUNTINGS FOR LIGHTING

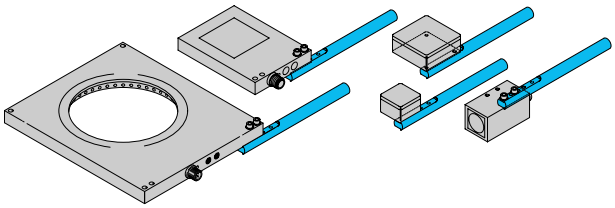
The fasteners for the various lighting systems from di-soric ensure a secure hold in all installation positions.

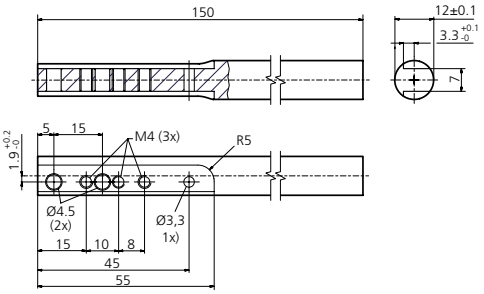
Basic holder for barlights and coaxial lights



Barlights	
Coaxial lights	
Material: Aluminum	SH-G-BE

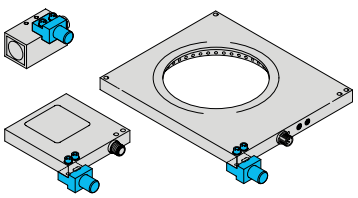
Universal holder for lights

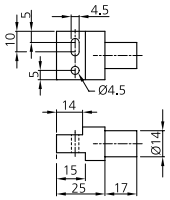




Area lights	
Barlights	
Spotlights	
Darkfield lights	
Material: VA	SH-U1-12-150-V

Holder for area lights, spotlights and dark field lights



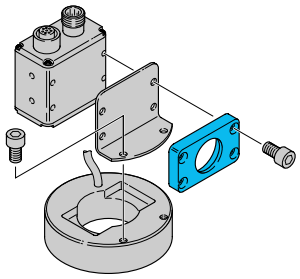


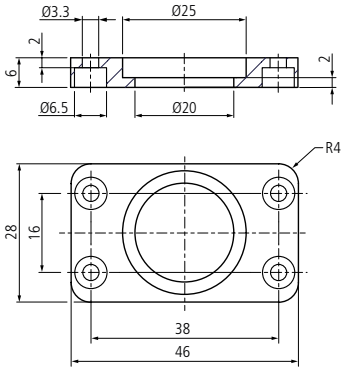
Area lights	
Spotlights	
Darkfield lights	
Material: Aluminum	SH-BEK

MOUNTING TECHNOLOGY FOR INDUSTRIAL IMAGE PROCESSING / IDENTIFICATION SYSTEMS

The mounting products for the image processing and identification systems from di-soric ensure precision mounting and stable processes.

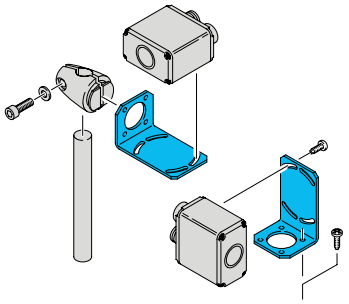
Adapter plate for mounting a high-power BEK-R33 attachment light at the CS 50 Vision Sensor

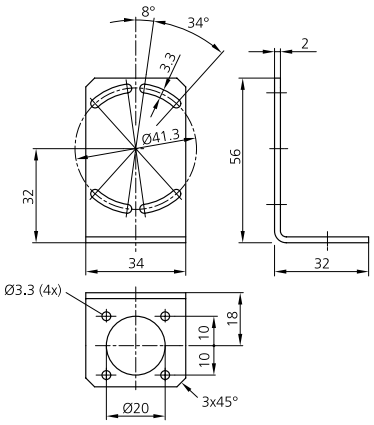




Material: VA	SH-G-CSR

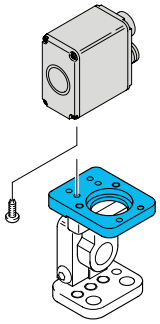
Fastening bracket for CS 50 Vision Sensor

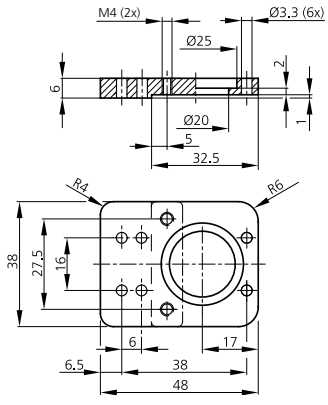




Material: VA	HS-BW-CS

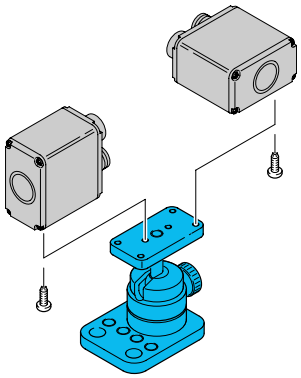
Mounting plate for CS 50 Vision Sensor

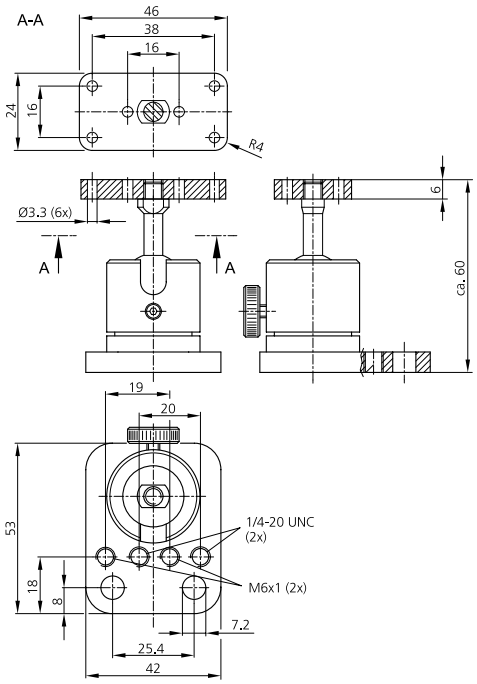




Material: Aluminum	SH-G-CS

Ball head holder, adjustable for CS 50 Vision Sensor

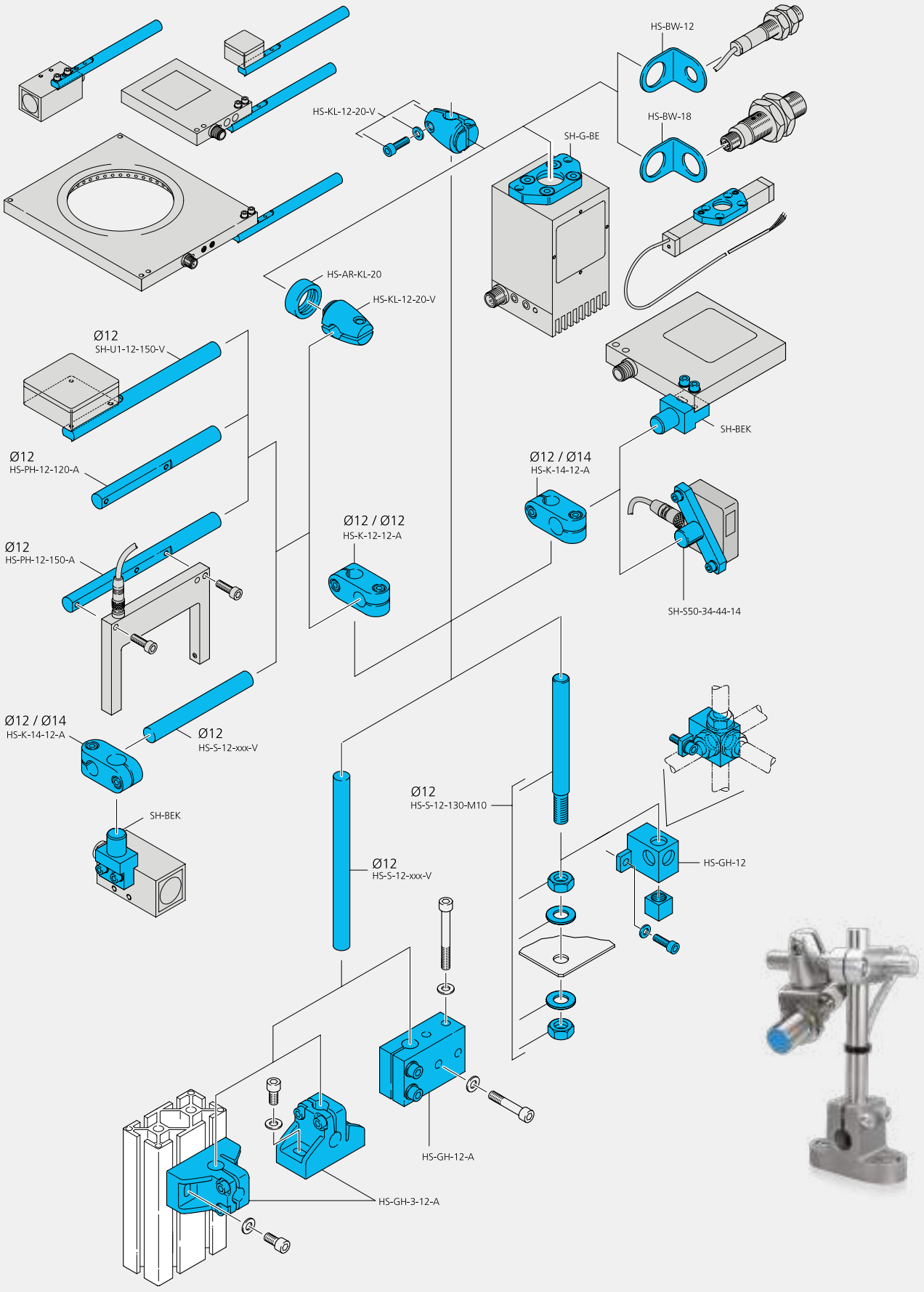




Material: Aluminum	SH-KK-CS

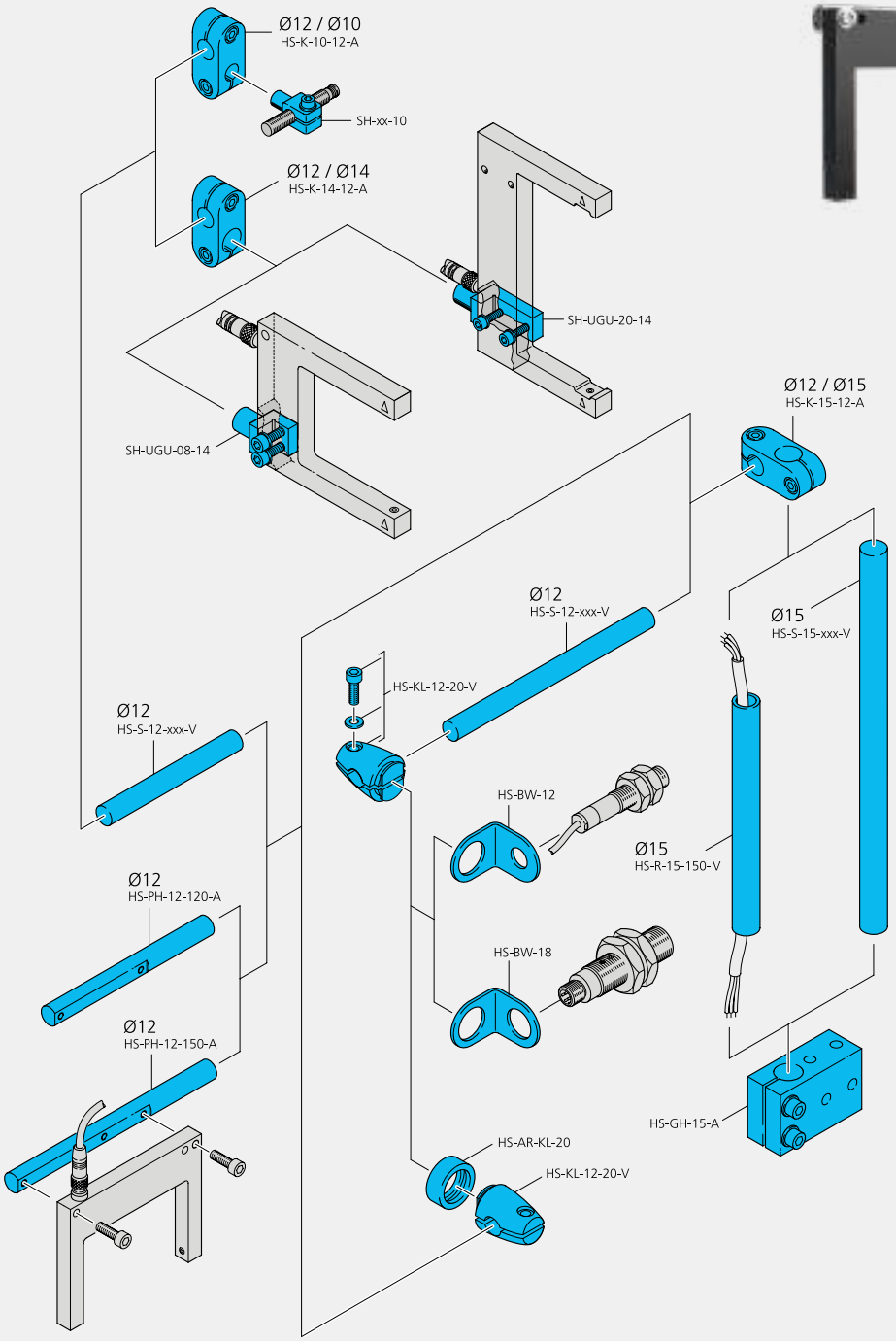
Mounting examples system holder, basic holder

Ø 12 mm



Mounting examples system holders, basic holder

Ø 15 mm



NOTES

NOTES

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SOLUTIONS. CLEVER. PRACTICAL.

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